Mathematics

QUESTIONS BANK

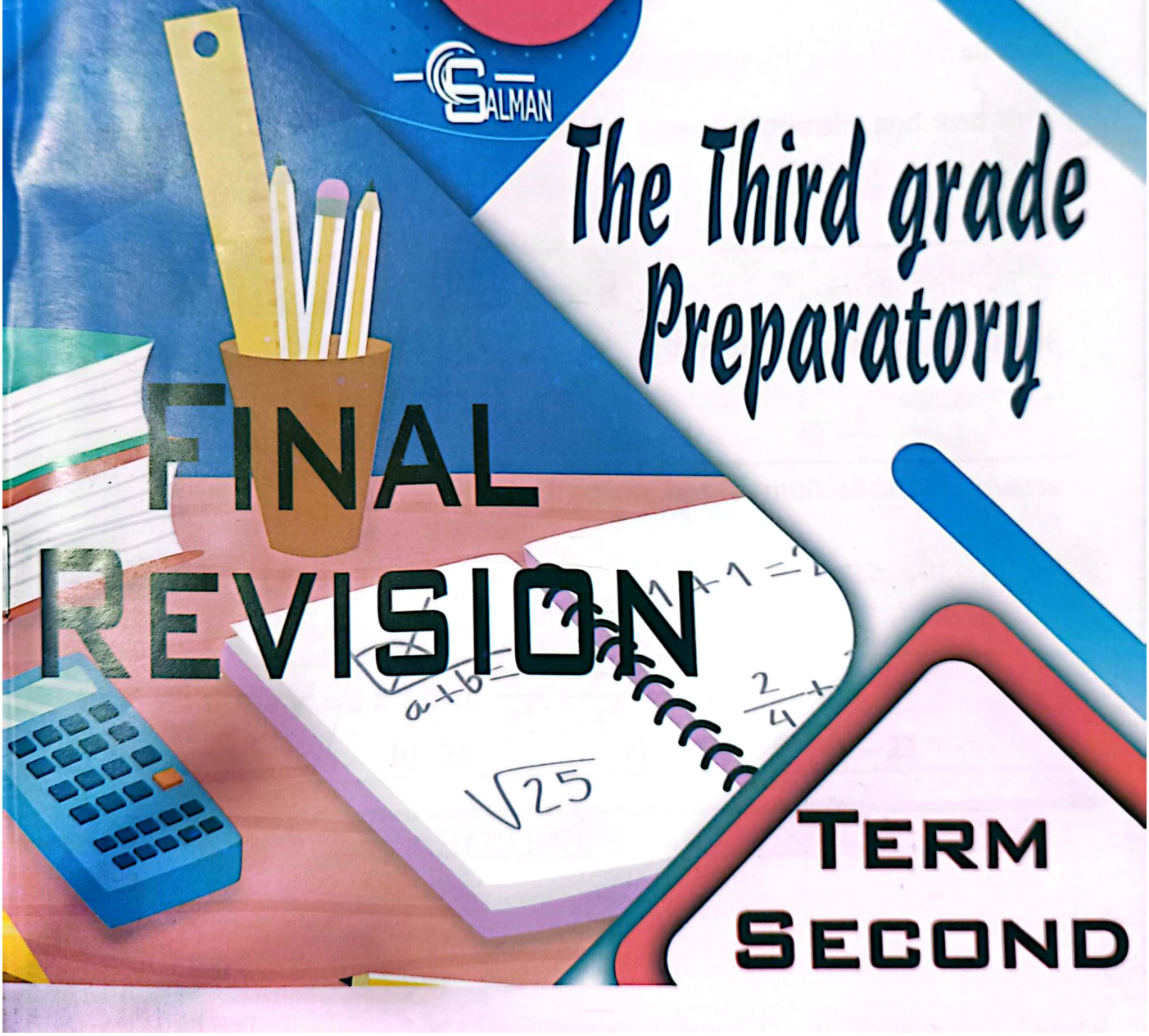
محافظة الدقهلية
DAKAHLYA GOVERNORATE

P3

SALMAN

The Third grade Preparatory

FINAL REVISION



TERM SECOND

MODEL EXAM NO (1)

[Q1] [A] Choose the correct answer:

(1) The two equations $3X1 - 5Y = 8$, $X + KY = m$ have infinite solution in $R \times R$ when $9\ K\ m$= .....

a) $\frac{-10}{3}$ b) $\frac{16}{3}$ c) -16 d) -160

(2) If the set of zeros of $F(x) = KX + 3$ is $\emptyset$, then K = ...

a) -3 b) 3 c) 0 d) 1

(3) The function $n(x) = \frac{x-2}{x-5}$, has an additive inverse in the domain....

a) $R-\{2\}$ b) $R-\{5,-2\}$ c) $R-\{5\}$ d) $R-\{5,2\}$

[B] If $n_1(x) = \frac{3x-6}{x^2-4}$, $n_2(x) = \frac{3x+3}{x^2+3x+2}$ prove that $n_1(x) = n_2(x)$ for all the values of X which belongs to the common domain and find this domain?

[Q2] [A] Choose the correct answer:

(1) If S is a sample space of a random experiment, then $P(S') =$ .....

a) 1 b) 0 c) -1 d) $\frac{1}{2}$

(2) If $\frac{x-a}{x+3}$ is an algebraic fraction has a multiplicative inverse is $\frac{x+3}{x+5}$ then a = ...

a) -5 b) -3 c) 5 d) 3

(3) If $X^2 + y^2 = 5XY$ then $\frac{x^2}{y^2} + \frac{y^2}{x^2}$ = ...

a) 32 b) 23 c) -32 d) -23

[B] By using a general formula and find in R the solution set of the equation: $-1 - \frac{2}{x} = \frac{5}{x^2}$, approximating the result to nearest two decimal places.

[Q3]

[A] Choose the correct answer:

(1) The two straight lines: X = 3, Y = 5 are ....

a) Parallel c) Coincident

b) perpendicular d) Intersecting and not perpendicular

(2) The equation: $\frac{1}{x} + \frac{1}{y} = 3$ in ..... Degree ($x \neq y \neq 0$)

a) First b) Second c) Third d) Fourth

(3) The number of solution of the equation : $2x - 6 = 0$ in R^2 is ....

a) 1 b) 2 c) 3 d) infinite

[B] A rectangle of perimeter 14 cm. and its diagonal length 5 cm.

↳ Find its two dimensions?

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[4]

[A] If the set of zeros of F (X) = $\frac{x^2 - ax + 9}{bx + 4}$ is { 3 }, and its domain R – { 2 }.

↳ Find the value of a , b ?

[B] If A, B are two events of the sample space of a random experiment, and $P(A-B)=\frac{5}{12}$, $P(B)=\frac{1}{3}$, $P(A)=P(A')$,

Find: ① probability of occurrence one of them at least.

② Probability of occurrence event B only.

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[5]

[A] Find in the simplest form: $n(X)=\frac{x^2-2x-15}{x^2-9}\div\frac{x^2-25}{x^2-3x}$

and showing its domain. If $n(k)=\frac{1}{3}$,

Find the value of K.

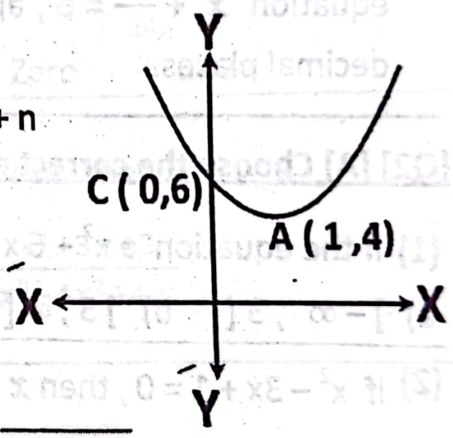
[B] In the opposite figure:

The curve of $\mathcal{F}$: $\mathcal{F}(x)=kX^2+mX+n$

Cut y-axis in C (0 , 6) , A (1 , 4)

is the vertex of the curve

Find the value of K, m, n.



End of the questions

MODEL EXAM NO (2)

[Q1] [A] Choose the correct answer:

(1) If A is an event in a sample space of a random experiment, then $P(A \cup A') =$ .....

a) 1 b) 0 c) −1 d) half

(2) The set of zeros of $\mathcal{F}(x) = \frac{x^2-x-2}{x^2-4}$ is .....

a) $\{-1, 2\}$ b) $\{-2, 2\}$ c) $\{-1\}$ d) $\{-2\}$

(3) The intersecting point of the two straight lines:
$3x + y = 0$, $2x = 7y$, lies in .....

a) First quadrant
b) Second quadrant
c) Third quadrant
d) On origin point

[B] By using a general formula, find in $\mathcal{R}$ the solution set of the equation $x + \frac{4}{x} = 6$, approximating the result to nearest three decimal places.

[Q2] [A] Choose the correct answer:

(1) If the equation $ax^2 + 6x + 3 = 0$, hasn't real solution then a ...

a) $]-\infty, 3[$ b) $]3, \infty[$ c) $\{3\}$ d) $\{3, -3\}$

(2) If $x^2 - 3x + 1 = 0$, then $x + \frac{1}{x} =$ ..... (where $x \neq 0$)

a) 1 b) 3 c) −1 d) −3

(3) If $n(x) = \frac{x^2-x}{x^2-1}$, $n^{-1}(k) = 3$, then K = ...

a) $-\frac{3}{2}$ b) $\frac{1}{2}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$

[B] A rhombus the difference between their diagonal 4 cm. and its perimeter 40 cm. Find the length of its diagonals?

[Q3]

[A] Choose the correct answer:

(1) A two digit number, its unit digit = its tens digit = X, then the number is .....

a) X^2 b) 2 X c) 11 X d) $10X^2$

(2) If n is a function: $n(x) = \frac{x+1}{x-1} + \frac{1-x}{x-1}$,$(x \neq 1)$, then n in the simplest form is .....

a) 0 b) $\frac{2}{2x-2}$ c) $\frac{2}{x-1}$ d) $\frac{2}{(x-1)^2}$

(3) If A, B are two mutually exclusive events from a sample space, then $A \cap B$ = ...

a) $\varnothing$ b) S c) Zero d) 1

[B] If n_1 , n_2 two algebraic fractions, Prove that $n_1 = n_2$?

Where $n_1(x) = \frac{x^2-x}{x^3-2x^2}$, $n_2(x) = \frac{x^2-3x+2}{x^3-4x^2+4x}$

[Q4]

[A] Find n(x) in the simplest form showing its domain:

$$n(x) = \frac{x^2-2x-15}{x^2-9} \div \frac{2x-10}{x^2-6x+9}$$

[B] If the domain of $n(x) = \frac{k}{x-3} + \frac{4}{x+m}$ is $\mathcal{R} - \{3, -4\}$, $n(2) = 7$

↳ Find the value of k , m ?

[Q5]

[A] If A,B are two events of the sample space of a random experiment, and $P(A) = \frac{1}{2}$, $P(B) = \frac{2}{5}$, $P(A \cap B) = \frac{1}{10}$ Find:

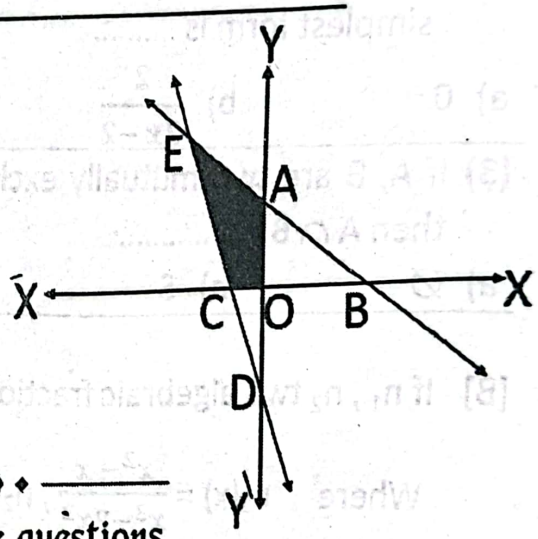
① $P(A \cup B)$ ② $P(B - A)$

[B] In the opposite figure:

If the equation of $\overleftrightarrow{AB}$: $X + Y = 3$,

Equation of $\overleftrightarrow{CD}$: $2X + Y + 4 = 0$

Find the area of the shaded part



End of the questions

MODEL EXAM NO (3)

[Q1] A) Choose the correct answer:

(1) If A , B are two events of the sample space of a random P (A∩B), $(A - B) \cup (B \cap A)$ = ...

a) 1 b) S c) B d) A

(2) If the domain of $F(X) = \frac{-2x}{x-5} - \frac{1}{k-x}$ is $R - \{5, -2\}$, then k = ...

a) 2 b) 5 c) −2 d) −5

(3) If AB = 12, BC = 20, AC = 15 where A,B,C $\in R^+$ then ABC= ....

a) 360 b) 3600 c) 60 d) 36

[B] By using a general formula and, find in R the solution set of the equation: $(X - 2)^2 = 6X$, approximating the result into two decimal places

[Q2] A) Choose the correct answer:

(1) If $x + \frac{2}{x} = 1$, then $\frac{x^2+x+2}{x^2(1-x)}$ = ... where $x \neq 0$

a) 1 b) 2 c) −1 d) −2

(2) The two equations X + 4 Y = 7, 3 X + K Y = 21 have infinite solution in R × R when K= .....

a) 4 b) 7 c) 12 d) 21

(3) If $F(X) = x^2 + ax + 1$, $Z(f) = \emptyset$, then a can be = ...

a) 3 b) 2 c) 1 d) −2

B): Find F (X) in its simplest form and showing its domain,

$$F(x) = \frac{x^2+2x}{x^3-27} \div \frac{x+2}{x^2+3x+9}$$

[Q3]

[A] Choose the correct answer:

(1) The two straight lines X = 3 , 3Y = 5 are .....

a) perpendicular c) Parallel

b) Coincide d) Intersecting and not perpendicular

(2) If $n(x) = \frac{x-1}{x-2}$, then the domain of $n^{-1}(x)$ = ...

a) R b) $R-\{1\}$ c) $R-\{1,2\}$ d) $R-\{2\}$

(3) If A , B are two events from the sample space of a random experiment, $A \subset B$, then $P(A \cup B)$ = ...

a) Zero b) P (B) c) P (A) d) $P(A \cap B)$

[B] If $n_1(x) = \frac{x^3+1}{x^3-2x^2+x}$, $n_2(x) = \frac{x^3+x^2+x+1}{x^3+x}$

Show that if $n_1(x) = n_2(x)$ Give the reason?

[Q4] A) If $n(X) = \frac{x^2-2x}{x^2+x-6}$ Find:

① $n^{-1}(x)$ showing its domain

② If $n^{-1}(x) = 2$, find the value of X.

[B] If the length of a rectangle exceeds its width with 3 cm, its area 28 cm^2. find its perimeter.

[Q5]

A) Find in $\mathcal{R} \times \mathcal{R}$ the solution set of two equations:

$$2|X| - |Y| = 2 \ , 3|X| + |Y| = 3$$

[B] If A , B are two events of the sample space of a random experiment, and $P(A) = P(A')$, $P(B) = \frac{5}{8} P(A)$, $P(A \cap B) = \frac{1}{16}$,

Find: ① $P(B)$, $P(A \cup B)$

② $P(A - B)$

End of the questions

Model Exam No (4)

[Q1] A) Choose the correct answer:

(1) If $n_1(x) = \frac{1}{x-3}$, $n_2(x) = \frac{9}{x+8}$ then the domain of $(n_1 . n_2)$ = ...

a) $\{3, -8\}$ b) $R-\{3, -8\}$ c) $R-\{3\}$ d) $R-\{8\}$

(2) If the two equations $X + 2Y = 1$, $2X + aY = 5$ have one solution, then $a \in R - \{$ ..... $\}$

a) 1 b) 2 c) 4 d) −4

(3) If $X + Y = 15$, then $(X-10)^3 + (Y-5)^3$ = ...

a) 0 b) 25 c) 125 d) 625

[B] Find the value of a , b where (1 , 2) is solution of two equations :

$aX + bY + 5 = 0$, $2aX + bY - 2 = 0$

[Q2] A) Choose the correct answer:

(1) A card is drawn randomly from some cards numbered from 1 to 50, the probability of this card contains a non– perfect square is .....

a) $\frac{7}{50}$ b) $\frac{43}{50}$ c) $\frac{1}{2}$ d) $\frac{9}{50}$

(2) If $X^2 - Y^2 = 80$, $X - Y = 8$, The mean of the two numbers X and Y is

a) 2 b) 3 c) 4 d) 5

(3) If $x + \frac{1}{x-2} = 4$,then $(x-2)^2 + \frac{1}{(x-2)^2}$ = ... where $x \neq 0$

a) −2 b) 2 c) 4 d) 0

[B] If the domain of $n(x) = \frac{k}{x-3} + \frac{4}{x+m}$ is $R - \{3, -4\}$, $n(2) = 7$,

Find the value of k , m ?

[Q3]

[A] Choose the correct answer:

(1) The set of zeros of the function $F(x) = -3X$ are .....

a) {Zero} b) {3} c) {−3} d) R − {3}

(2) The simplest form of the function $n(x) = \frac{3-x}{x-3}$, where $X \in R - \{3\}$ is .....

a) 1 b) −1 c) 3 d) −3

(3) If $n(x) = \frac{x-3}{x+2}$, then the domain of $n^{-1}(x)$ = ...

a) $\{-2, 3\}$ b) $R - \{-2, 3\}$ c) $R - \{-2\}$ d) $R - \{3\}$

[B] The difference between the perimeter of two squares 12 cm. and the difference between the areas of two squares 33 cm^2. Find the length of side of each square?

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[4]

[A] Find n (x) in the simplest form and showing its domain:

$$n(x) = \frac{x^2+3x+9}{x^3-27} - \frac{x^2-x-12}{9-x^2}$$

[B] By using a general formula:

Find in $\mathcal{R}$ the solution set of the equation $\frac{5}{x^2} - \frac{2}{x} = 1$, approximating the result to nearest three decimal places. Where $\sqrt{6} = 2.45$

[Q5]

[A] Find n (x) in the simplest form and showing its domain:

$$n(x) = \frac{x^2+x+1}{x^3-1} \div \frac{x^2-x}{x^2-2x+1}$$

[B] If A , B are two events of the sample space of a random experiment, and P (A) = 0.2, P (A – B) = 0.3 , P (B– A) = 0.4

Find: ① P (B)

② P (B ∪ A)

End of the questions

MODEL EXAM NO (5)

[Q1] A) Choose the correct answer:

(1) If intersection point of two lines $X-1=0$, $Y-2k=0$ lies in fourth quadrant then k may be .....

a) -5 b) 0 c) 1 d) 5

(2) The domain of the additive inverse of $n(x)=\frac{x}{x-3}$ is .....

a) R b) $R-\{0\}$ c) $R-\{3\}$ d) $R-\{0,3\}$

(3) If : $X^2=Y+Z$, $Y^2=Z+X$, $Z^2=X+Y$ then $\frac{1}{x+1}+\frac{1}{y+1}+\frac{1}{z+1}=$ .....

a) -1 b) 1 c) 2 d) 4

B): By using a general formula, find in R the solution set of the equation $X+\frac{4}{x}=6$, approximating the result to three decimal place.

[Q2] A) Choose the correct answer:

(1) If A is an event of the sample space of a random experiment, and $P(A)=4P(\acute{A})$ then $P(A)=$ .....

a) 0.8 b) 0.6 c) 0.4 d) 0.2

(2) The degree of the equation $XY=3$ is .....

a) First b) Second c) Third d) zero

(3) If $x(3-\frac{2}{x})=\frac{3}{x}$,then $(x)^2+\frac{1}{(x)^2}=$ ..... where $x\neq 0$

a) $2\frac{1}{9}$ b) $2\frac{4}{9}$ c) $3\frac{1}{9}$ d) $3\frac{4}{9}$

[B] If the area of rectangle 77 cm^2, if its length decreased by 2 cm and its width increased by 2 cm, it will be a square. Find the area of square.

[Q3]

[A] Choose the correct answer:

(1) If $n(x) = \frac{x-2}{x+5}$, then the domain of $n^{-1}(x)$ = ...

a) R b) $R-\{2\}$ c) $R-\{-5\}$ d) $R-\{2,-5\}$

(2) If A , B are two mutually exclusive events from the sample space of a random experiment, then P (A – B) = ...

a) P (B) b) P (A) c) 0 d) 1

(3) If $F(x) = \frac{7+x}{7-x}$, where $X \in R-\{\pm 7\}$, then F(–2) = ...

a) $\frac{-1}{f(-2)}$ b) $\frac{-1}{f(2)}$ c) $\frac{1}{f(2)}$ d) $\frac{1}{f(-2)}$

[B] n_1 , n_2 two algebraic fractions, $n_1(x) = \frac{x^2-4}{x^2+x-6}$,

$n_2(x) = \frac{x^3-x^2-6x}{x^3-9x}$, prove that $n_1(x) = n_2(x)$ For all values of x in common domain and Find this domain ?

[Q4]

[A] Find n(x) in the simplest form showing its domain:

$$n(x) = \frac{x^2-2x}{x^4-3x^3+2x^2} \times \frac{4-x^2}{x^2+x-2}$$

↳ Find the S.S when n (x) =0

[B] If A , B are two events of the sample space of a random experiment, and $P(B) = \frac{1}{3}$, $P(A-B) = \frac{1}{4}$, find P (A) if:

① $P(A \cap B) = \frac{1}{12}$

② $B \subset A$

[Q5]

[A] Find n (x) in the simplest form showing its domain:

$$n(x) = \frac{x^2-2x-15}{x^2-9} \div \frac{x^2-25}{x^2-3x}$$

↳ Find the value of A if $n(A) = \frac{1}{3}$

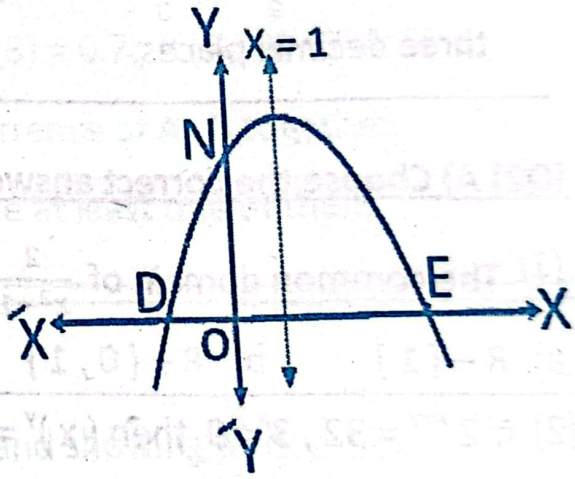
[B] In the opposite figure:

The quadratic curve of $\mathcal{F}$:

$\mathcal{F}(x) = a X^2 + b X + c$

The axis of symmetry is X = 1

N (0,12) , E (3,0) Find $\mathcal{F}(x)$



End of the questions

MODEL EXAM NO (6)

[Q1] A) Choose the correct answer:

(1) The two equations $X + 4Y = m$, $3X + KY = 21$ have infinite solution in $R \times R$ when $K + m =$ .....

a) 19 b) 20 c) 21 d) 22

(2) If : $X^2 - 4x - 1 = 0$, then $3x - \frac{3}{x}$ =.....

a) 2 b) 3 c) 4 d) 12

(3) If a coin tossing once, the probability of appearing head or tail equal.....

a) 100 % b) 50 % c) 25 % d) 0

[B] By using a general formula, find in R the solution set of the equation $\frac{x^2}{9} + \frac{4}{3}x = -2$, approximating the result to nearest three decimal places.

[Q2] A) Choose the correct answer:

(1) The common domain of $\frac{2}{x^2-1}$, $\frac{5x}{x^2-x}$ is .....

a) $R-\{1\}$ b) $R-\{0,1\}$ c) $R-\{-1,1\}$ d) $R-\{0,1,-1\}$

(2) If $2^{x+y} = 32$, $3^x = 9$ then $(x)^y$ = ...

a) $\frac{1}{8}$ b) 8 c) $\frac{1}{9}$ d) 9

(3) If the domain of $n(x) = \frac{x+b}{x+a}$ is $R - \{-2\}$, $n(0) = 3$, then the value of $a + b$ = ...

a) 2 b) 6 c) 8 d) 10

[B] Find in $R \times R$ solution set of two equations:

$$X + Y = 2 , \frac{1}{x} + \frac{1}{y} = 2 \text{ where } X \neq 0 , Y \neq 0$$

[Q3]

[A] Choose the correct answer:

(1) If the curve of the quadratic function F passing through the points (2 , 0) , (− 3 , 0) , (0 , − 6), then the solution set of the function F (X) = 0 in R is .....

a) {−2 , 3} b) {3 , 2} c) {2 , −3} d) {−3 , −6}

(2) The simplest form of the function $n(x) = \frac{3-x}{x-3}$, where $X \in R - \{3\}$ is .....

a) 1 b) −1 c) 3 d) −3

(3) If A is an event from the sample space, then $P(A') =$ .....

a) 1 b) −1 c) 1 − P(A) d) P(A) − 1

[B] If A , B are two events of the sample space of a random experiment, and P (A) = 0.6 , P (B) = 0.7 , P (A∩B) = 0.4, Find:

① The probability of non–occurrence of A , B together.

② The probability of occurrence at least one of them.

[Q4]

[A] Find n(x) in the simplest form and showing its domain:

$$n(x) = \frac{x-6}{2x^2-15x+18} + \frac{x-5}{15-13x+2x^2}$$

[B] n_1 , n_2 two algebraic fractions, $n_1(x) = \frac{x^3+1}{x^3-x^2+x}$, $n_2(x) = \frac{x^3+x^2+x+1}{x^3+x}$

↳ Show that if $n_1 = n_2$ or not with giving the reason

[Q5]

[A] Find n(x) in the simplest form showing its domain:

$$n(x) = \frac{x^2-2x-15}{x^2-9} \div \frac{2x-10}{x^2-6x+9}$$

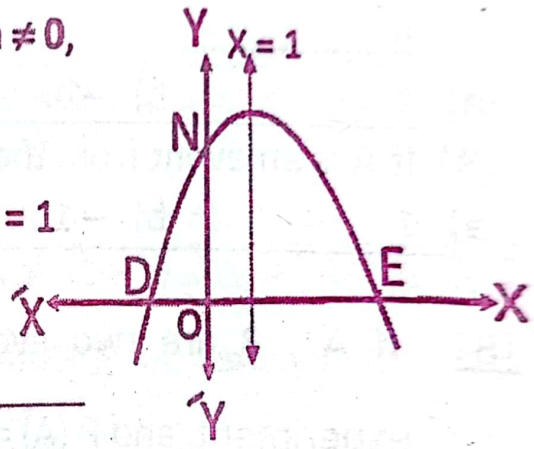
[B] The opposite figure represents the curve

Of function $\mathcal{F}$: $\mathcal{F}(x) = a x^2 + b X + c$, $a \neq 0$,

If OK = 30 unit length, 5 OD = 3 OE

And equation of line of symmetry is X = 1

Find the value of a , b , c



End of the questions

MODEL EXAM NO (7)

[Q1] [A] Choose the correct answer:

(1) A circle of radius 4 cm and its center is origin point, which of the following points not belong to the circle?

a) (0, 4) b) (4, 0) c) (0, −4) d) (4, 4)

(2) If straight line L lies outside circle of diameter 10 cm, and the distance between L and center of circle is X, then X ∈ .....

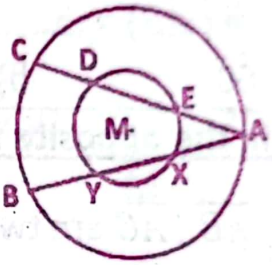
a) [0, 5] b)]0, 5[c) [0, 5[d)]5, ∞[

(3) In the opposite figure:
C is midpoint of $\overset{\frown}{AB}$, Then AB .... 2 AC

a) > b) < c) ≥ d) =

[B] In the opposite figure:

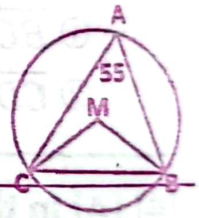
Two concentric circles at M, $\overline{AB}$ is chord in greater circle and cut smaller circle at X , Y, $\overline{AC}$ is chord in greater circle cut smaller circle in D , E , if AB = AC



↳ **Prove that:** DE = XY

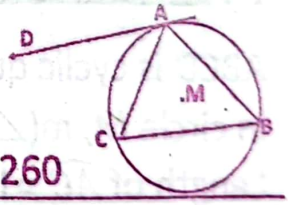
[Q2] [A] Choose the correct answer:

(1) In the opposite figure:
M(∠A) = 55°, m (∠(MCB) = ...°



a) 180 b) 90 c) 100 d) 110

(2) In the opposite figure:
$\overrightarrow{AD}$ is tangent to circle M at A,
m(∠DAB) = 130°, Then m(∠C) = ...°

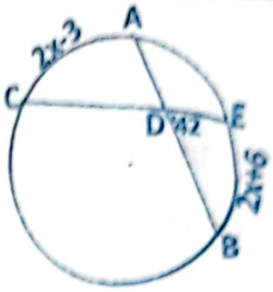


a) 50 b) 65 c) 130 d) 260

(3) We can't draw circle passing through vertices of .....

a) Parallelogram b) Square c) Rectangle d) Isosceles trapezium

[B] In the opposite figure:



$\overline{AB} \cap \overline{EC}$ = {D}, m(∠EDB) = 42°

M($\overset{\frown}{EB}$) = (2 X + 6)°, m ($\overset{\frown}{AC}$) = (3 X − 2)°

Find the value of C?

[Q3] [A] Choose the correct answer:

(1) Sum of the interior angles of the cyclic quadrilateral is .....°

a) 90 b) 180 c) 360 d) 720

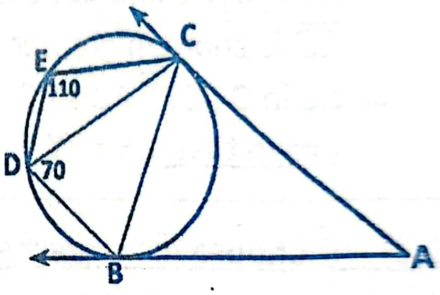
(2) The length of the arc whose opposite to half circle = ...

a) $2\pi r$ b) πr c) $\frac{1}{2}\pi r$ d) $\frac{1}{3}\pi r$

(3) If ABCDEF is a regular hexagon drawn inside a circle, then m ($\overset{\frown}{AB}$) = ...°

a) 60 b) 90 c) 180 d) 360

[B] In the opposite figure:



$\overrightarrow{AB}$, $\overrightarrow{AC}$ are two tangents at B, C

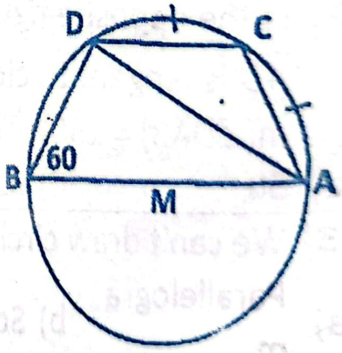
m(∠E) = 110°, m(∠BDC) =70°

Prove that:

① $\overrightarrow{BC}$ bisects ∠ ABD

② $\overrightarrow{CD}$ is tangent to circle passes through vertices of Δ ABC

[4] [A] In the opposite figure:



ABCD is cyclic quadrilateral, $\overline{AB}$ is diameter in circle M, m(∠B) = 60°

Length of $\overset{\frown}{AC}$ = length of $\overset{\frown}{CD}$

Prove that: $\overrightarrow{AD}$ bisects ∠ BAC

[B] XYZL is a Parallelogram, $\angle X$ is acute angle, $F \in \overline{ZL}$, $F \notin \overline{ZL}$ where YF = XL. **Prove that** XYLF is cyclic quadrilateral.

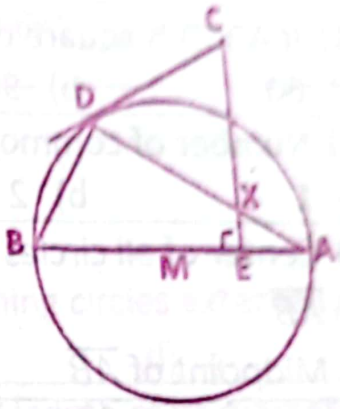
[Q5]

[A] In the opposite figure:

$\overline{AB}$ is diameter in circle M,

$\overline{CD}$ is tangent to circle D

If $\overline{CE} \perp \overline{AB}$, prove that: CX = CD

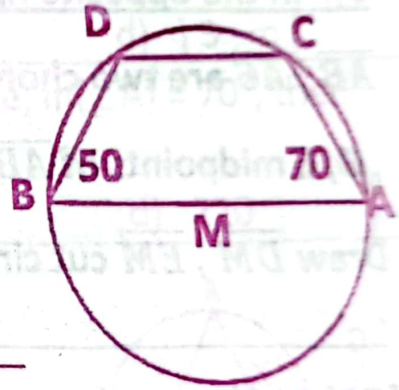


[B] In the opposite figure:

$\overline{AB}$ is diameter in circle M, its radius is 5 cm,

$m(\angle B) = 50°$, $m(\angle A) = 70°$,

Find the length of $\overline{CD}$



End of the questions

MODEL EXAM NO (8)

[Q1] A) Choose the correct answer:

(1) If ABCD is square drawn in a circle, then m ($\overset{\frown}{AB}$) = ... °

a) 60 b) 90 c) 120 d) 180

(2) Number of common tangent for two touching internally circles is

a) 1 b) 2 c) 3 d) Zero

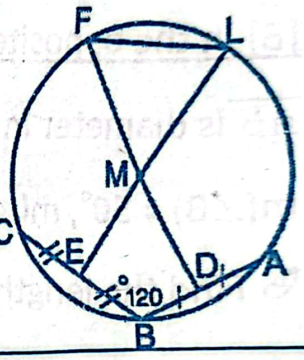
(3) Center of all circles passes through two points A , B lies on .....

a) $\overline{AB}$ b) Axis of $\overline{AB}$

c) Midpoint of $\overline{AB}$ d) Perpendicular on axis of $\overline{AB}$

B): In the opposite figure:

$\overline{AB}$, $\overline{AC}$ are two chords in circle M of radius 7 cm , D, E midpoints of $\overline{AB}$, $\overline{AC}$, m(∠BAC) = 120°, Draw $\overrightarrow{DM}$, $\overrightarrow{EM}$ cut circle in F, L find length of $\overline{LF}$

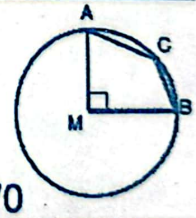


[Q2] A) Choose the correct answer:

(1) Circle of area X π cm^2, straight line L of distant (X + 1) cm form its center, then L lies ..... Circle

a) Outside the b) Secant of c) Tangent of d) Axis of

(2) In the opposite figure:
$\overline{MA} \perp \overline{MB}$,
Then m(∠ACB) = ... °



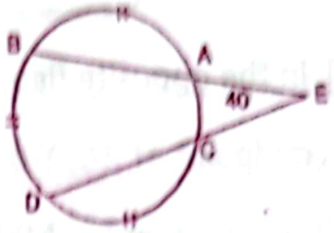
a) 90 b) 135 c) 110 d) 270

(3) The center of circumcircle of a triangle is intersection point of ....

a) Medians c) Axes of its sides

b) Altitudes d) Bisectors of its angles

B): In the opposite figure:



$M(\overset{\frown}{AB}) = m(\overset{\frown}{DB}) = m(\overset{\frown}{DC})$

$M(\angle C) = 40°$, find $m(\overset{\frown}{AC})$

[Q3]

[A] Choose the correct answer:

(1) Number of symmetric axes of two touching circles externally is...

a) 0 b) 1 c) 2 d) ∞

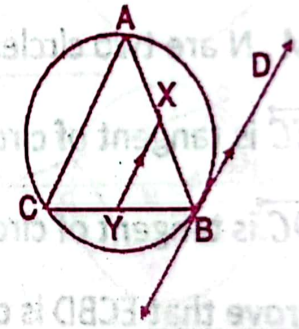
(2) If point A lies on surface of circle M and length of its diameter is 6 cm, then $m \in$ .....

a) $]-\infty, 6]$ b) $]-\infty, 3]$ c) $[0, 3]$ d) $]3, \infty[$

(3) ABCD is a quadrilateral inscribed in a circle, $m(\angle A) = 70°$, then $m(BAD) =$ .....°

a) 35 b) 55 c) 140 d) 220

[B] In the opposite figure:



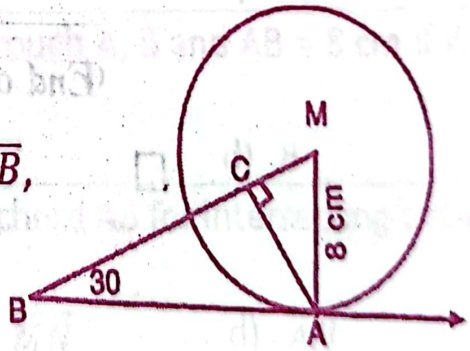
ABC is triangle drawn in a circle,

$\overrightarrow{BD}$ is tangent, $\overline{BD} \parallel \overline{XY}$

Prove that: AXYC is cyclic quadrilateral.

[Q4]

[A] In the opposite figure:



$\overrightarrow{BA}$ is tangent of circle M at A, $\overline{AC} \perp \overline{MB}$,

MA = 8 cm, $m(\angle B) = 30°$

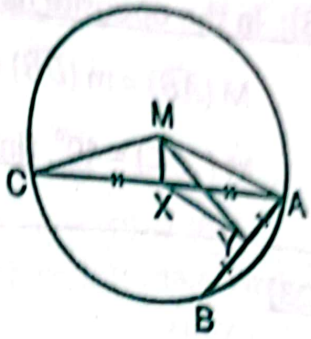
Find the length of $\overline{AB}$, $\overline{AC}$

[B] In the opposite figure:

X is midpoint of $\overline{AC}$, Y is midpoint of $\overline{AB}$

① Prove that: m (∠ MYX) = m (∠ MCX)

② $\overline{AM}$ is diameter in circle passes A , Y , X , M

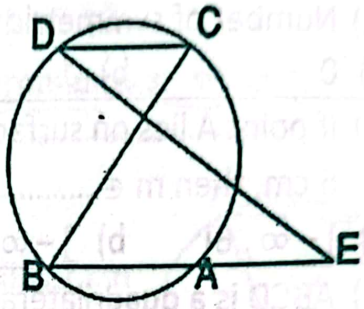


[Q5]

[A] In the opposite figure:

E is a point outside the circle

Prove that: m(E) < m (BCD)



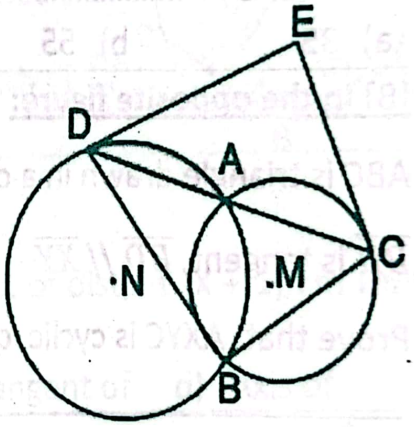
[B] In the opposite figure:

M , N are two circles intersecting at A, B

$\overleftrightarrow{EC}$ is tangent of circle M at C,

$\overleftrightarrow{DC}$ is tangent of circle N at D

Prove that ECBD is cyclic quadrilateral



End of the questions

MODEL EXAM NO (9)

[Q1] A) Choose the correct answer:

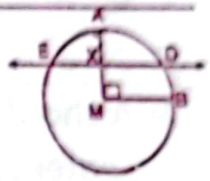
(1) If the circumference of circle 36 cm, then measure of an arc of length 6 cm = ... °

a) 30 b) 60 c) 90 d) 120

(2) A circle M of diameter 8 cm, A point inside it, if MA = (3X–2) cm then X ∈ .....

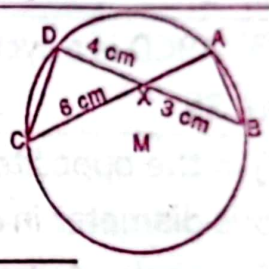
a) $]-\infty, 2[$ b) $[\frac{2}{3}, 2[$ c) $]\frac{2}{3}, 6]$ d) $[2, \infty[$

(3) In the opposite figure:
$\overline{MA}$, $\overline{MB}$ two perpendicular radii
$\overleftrightarrow{DE}$ is axis of $\overline{MA}$, then $m(\angle\widehat{BD}) = ...°$



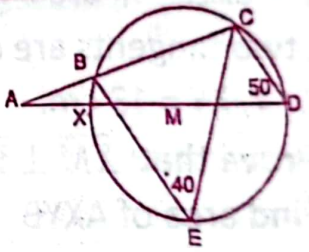
a) 30 b) 45 c) 90 d) 135

[B] In the opposite figure:
$\overline{AC} \cap \overline{DB} = \{X\}$, XC = 6 cm
XD = 4 cm, XB = 3 cm
Find length of $\overline{AX}$



[Q2] A) Choose the correct answer:

(1) In the opposite figure:
DX is diameter in circle M
$M(\angle E) = 40°$, then $m(\angle A) = ...°$



a) 20 b) 30 c) 40 d) 50

(2) We can't draw a circle passing through A, B and AB = 8 cm if its radius ..... cm

a) 3 b) 4 c) 7 d) 8

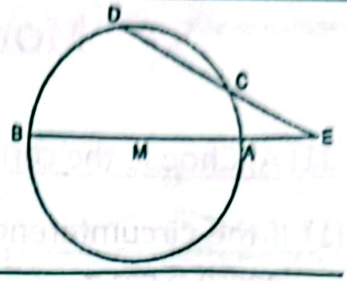
(3) The axis of symmetry of common chord AB for intersecting circle at A, B is .....

a) $\overleftrightarrow{MA}$ b) $\overleftrightarrow{MB}$ c) $\overleftrightarrow{MN}$ d) $\overleftrightarrow{AN}$

[B] In the opposite figure:

$\overline{AB}$ is diameter in circle M, $\overline{BA} \cap \overline{DC}$ = {E}

Prove that: EC > EA



[Q3]

[A] Choose the correct answer:

(1) Number of axes of symmetry of two touching externally circles is.....

a) Zero b) 1 c) 2 d) Infinite

(2) A chord of 8 cm in a circle of radius 5 cm, then its distance from center ..... Cm

a) 1 b) 2 c) 3 d) 4

(3) ABCD is a cyclic quadrilateral, m (∠A) = 70°, then m (∠ BAD)=...°

a) 35 b) 55 c) 140 d) 220

[B] In the opposite figure:

$\overline{AB}$ is diameter in circle M, AB = 10 cm

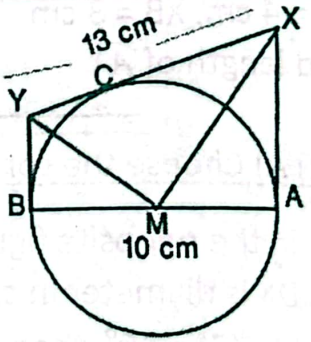
If C ∈ circle M, draw a tangent at C

cut two tangents are drawn at A, B

in X , Y, XY = 13 cm.

① **Prove** that: $\overline{XM} \perp \overline{YM}$

② **Find** area of AXYB



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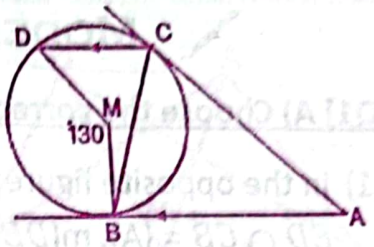
[4]

[A] ABCD is a quadrilateral drawn in a circle, F ∈ $\overline{AB}$, draw $\overrightarrow{FE}$ // $\overline{BC}$ and cut $\overline{CD}$ in E, $\overrightarrow{DF} \cap \overrightarrow{CB}$ = {X}

Prove that: ① AFED is cyclic quadrilateral

② m (∠BXF) = m (∠ EAD)

B) In the opposite figure:



$\overline{AB}$, $\overline{AC}$ are two tangents for circle M

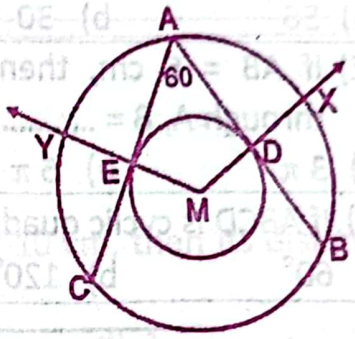
$\overline{AB} \parallel \overline{CD}$, m(∠BMD) = 130°

① **Prove that:** CB bisects ∠ ACD

② **Find by prove** m (∠ A)

[Q5]

[A] In the opposite figure:



Two concentric circles at M,

$\overline{AB}$, $\overline{AC}$ are two chords in greater circle

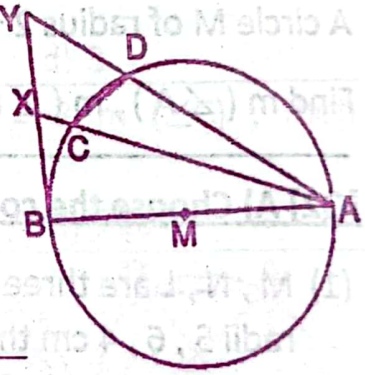
And touch smaller circle at D,E

Draw $\overrightarrow{MD}$, $\overrightarrow{ME}$ cut greater circle

at X,Y, m (∠DAE) = 60°

① Find m(∠DME) ② Prove XD = YE

B) In the opposite figure:



$\overline{AB}$ is diameter in circle M, $\overline{YB}$ is tangent

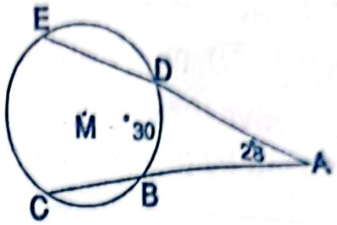
Prove that:

DCXY is cyclic quadrilateral

End of the questions

MODEL EXAM NO (10)

[Q1] A) Choose the correct answer:



(1) In the opposite figure:
$\overleftrightarrow{ED} \cap \overleftrightarrow{CB}$ = {A}, m($\widehat{DB}$) = 30°
M(∠A) = 28°, then m ($\widehat{EC}$) = ...°

a) 56 b) 30 c) 86 d) 28

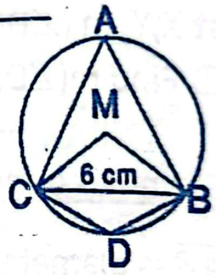
(2) If AB = 6 cm, then circumference of smallest circle passing through A, B = ... Cm

a) 3 π b) 6 π c) 8 π d) 9 π

(3) If ABCD is cyclic quadrilateral, m(∠A) −m(∠C) = 60°, then m(∠C)

a) 60° b) 120° c) 240° d) 360°

[B] In the opposite figure:



A circle M of radius $2\sqrt{3}$, BC = 6 cm

Find m (∠A) , m (∠BCD)

[Q2] A) Choose the correct answer:

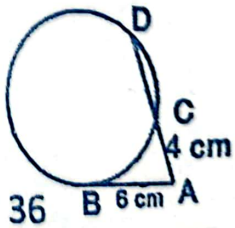
(1) M , N , L are three touching externally circles two by two, their radii 5 , 6 , 4 cm then perimeter of Δ MNL = ... cm

a) 15 b) 30 c) 40 d) 60

(2) The length of arc opposite to central angle of measure **120°** in a circle of radius r is .....

a) $\frac{1}{3}\pi r$ b) πr c) $\frac{2}{3}\pi r$ d) $3\pi r$

(3) **In the opposite figure:**
$\overline{AB}$ is tangent, AB = 6 cm,
AC = 4 cm Then CD = ... cm



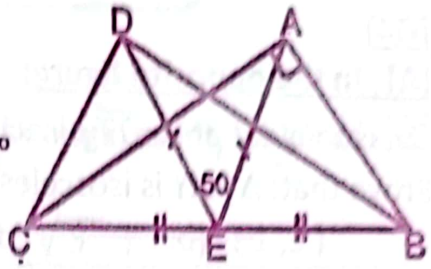
a) 5 b) 9 c) 12 d) 36

[B] In the opposite figure:

EB = EC , AE = ED

M(∠ AED) = 50°, m (∠ BAC) = 90°

Find m (∠ ABD)



[Q3]

[A] Choose the correct answer:

(1) A chord of 8 cm in a circle of diameter 10 cm, then its distance from center ..... Cm

a) 1 b) 2 c) 3 d) 4

(2) Number of axes of symmetry of two touching internally circles is.....

a) Zero b) 1 c) 2 d) 3

(3) ABCD is a cyclic quadrilateral, m (∠A) = 2 m (∠C) , then m (∠ A)=..... °

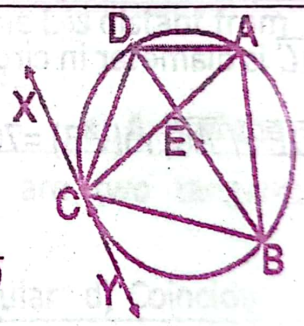
a) 35 b) 55 c) 140 d) 220

[B] In the opposite figure:

ABCD is quadrilateral is drawn in circle

Its diagonals intersect at E,

Draw $\overleftrightarrow{XY}$ tangent to circle at C where $\overleftrightarrow{XY} \parallel \overline{BD}$



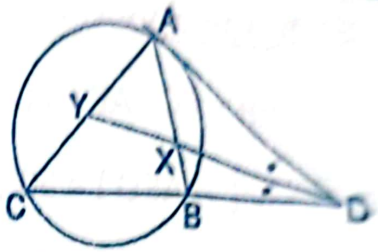
Prove that: $\overline{BC}$ is tangent to circle passing through vertices of Δ ABE

[Q4]

[A] In the opposite figure:

$\overrightarrow{DA}$ is tangent at A, $\overline{DY}$ bisects ∠ ADC

Prove that: Δ AXY is isosceles triangle



[B] ABCD is quadrilateral, m(∠A) = 7 X, m(∠B) = 4 X – 30°

m(∠C) = 2 X, m(∠D) = 5 X + 30°,

↳ **Prove that** ABCD is cyclic quadrilateral.

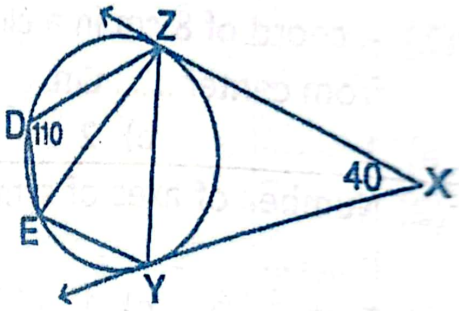
[Q5]

[A] In the opposite figure:

$\overrightarrow{XY}$, $\overrightarrow{XZ}$ are two tangents,

m(∠YXZ) =40°,m(∠ZDE) = 110°,

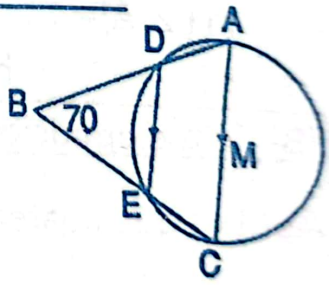
Prove that ZE = ZY



[B] In the opposite figure:

$\overline{AC}$ is diameter in circle M,

$\overline{DE}$ // $\overline{AC}$, m(∠B) =70°, Find m ($\overset{\frown}{DA}$)



End of the questions

Model Exam No (11)

[Q1] A) Choose the correct answer:

(1) A circle of radius 3 cm and its center is origin point, which of the following points lies on the circle?

a) $(\sqrt{5}, 0)$ b) $(2, \sqrt{5})$ c) $(1, \sqrt{3})$ d) $(1, 3)$

(2) Number of circles which passing through three collinear points is

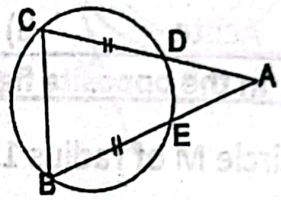
a) Zero b) 1 c) 3 d) Infinite

(3) In the opposite figure:
$M(\angle C) = 30°$, $m(\angle B) = 20°$
Then $m(\angle AME) =$ .....°

a) 20 b) 50 c) 100 d) 120

[B] In the opposite figure:

$\overline{EC}$, $\overline{DB}$ are two equal chords
$\overrightarrow{DB} \cap \overrightarrow{CE} = \{A\}$.
Prove that: AD = AE



[Q2] [A] Choose the correct answer:

(1) A circle M of diameter (2X+5) cm, straight line L is distant from its center (X+2) cm, X >0, then L is .....circle

a) Outside the b) Tangent to c) Secant to d) Axis of the

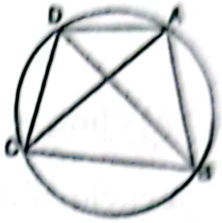
(2) If AB is diameter in circle M, $\overleftrightarrow{AC}$, $\overleftrightarrow{BD}$ are two tangents, then AC .....BD

a) Intersect b) Parallel c) Perpendicular d) Coincide

(3) In the opposite figure:
A quarter circle of center M,
C is midpoint of $\overline{AB}$, Then $m(\angle A) =$ .....°

a) 20 b) 30 c) 45 d) 60

[B] In the opposite figure:



AC = DB, AB = (3 X – 5) cm

DC = (x + 3) cm, find length of $\overline{AB}$

[Q3] [A] Choose the correct answer:

(1) If the longest chord in a circle is 12 cm, its circumference =.....

a) 6π b) 12π c) 24π d) 144π

(2) The radius of two circles M , N are 6 cm , 8 cm and MN = 14 cm, then the two circles are

a) Intersecting b) Distant

c) One inside other d) Touching externally

(3) The inscribed angel in half circle is .....

a) Acute b) Straight c) Right d) obtuse

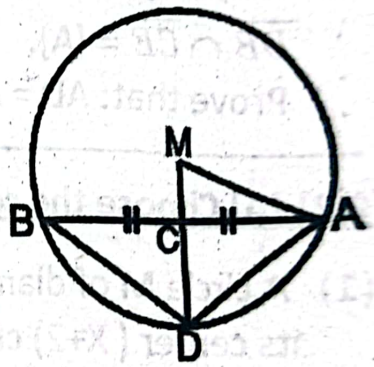
[B] In the opposite figure:

A circle M of radius 13 cm,

$\overline{AB}$ is chord of length 24 cm,

C is midpoint of $\overline{AB}$, $\overrightarrow{MC}$ ∩ circle = {D}.

Find by proof area of Δ ADB



[Q4]

[A] ABCD is a square, $\overrightarrow{AX}$ bisects ∠ BAC and cut $\overrightarrow{BD}$ in X, $\overrightarrow{DY}$ bisects ∠CDB and cut $\overline{AC}$ in Y, prove that:

① AXYD is cyclic quadrilateral

② m (∠ AYX) = 45°

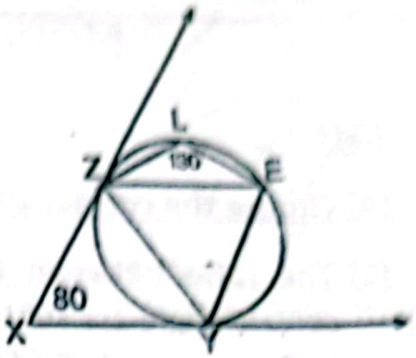
[B] In the opposite figure:

$\overrightarrow{XY}$, $\overrightarrow{XZ}$ are two tangents to circle at Y, Z

M(∠YXZ) = 80°, m (∠ELZ) = 130°

Prove that: ① ZE = ZY

② $\overline{XZ} \parallel \overline{EY}$



[Q5]

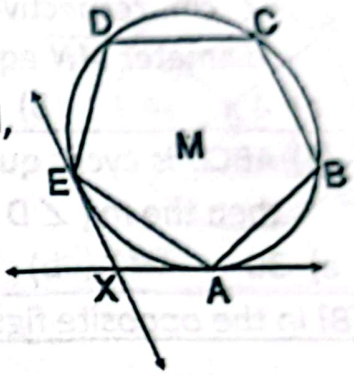
[A] In the opposite figure:

ABCDE is regular pentagon is drawn in circle M,

$\overrightarrow{AX}$ is tangent at A, $\overrightarrow{EX}$ is tangent at E

Where $\overrightarrow{AX} \cap \overrightarrow{EX}$ = {X},

Find m ($\widehat{EA}$) , m (∠ AXE)

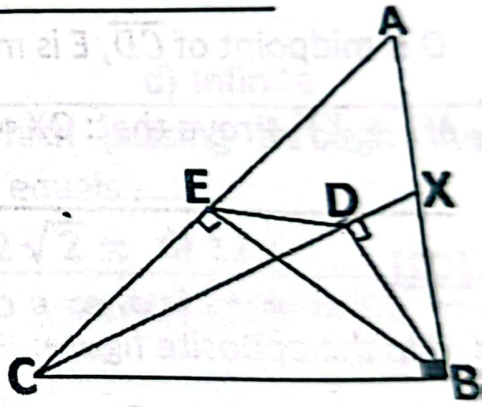


[B] In the opposite figure:

Δ ABC is right at B, $\overline{BE} \perp \overline{AC}$, $\overline{BD} \perp \overline{XC}$

Prove that:

AXDE is cyclic quadrilateral□



End of the questions

MODEL EXAM NO (12)

[Q1]

[A] Choose the correct answer:

(1) The ratio between the mea... of inscribe... ngle and the central angle are subtended by ...ne arc equals .....

a) 1 : 2 b) 2 : 1 c) 1 : 1 d) 1 : 3

(2) If M, N are two circles are touching externally their radii 2 cm , 4 cm respectively, then the circumference of circle whose diameter $\overline{MN}$ equals ..... cm

a) 4π b) 6π c) 8π d) 12π

(3) ABCD is cyclic quadrilateral, m ($\angle$ A) = 2 m ($\angle$ B) = 5 m ($\angle$C), then the m ($\angle$ D) = ...°

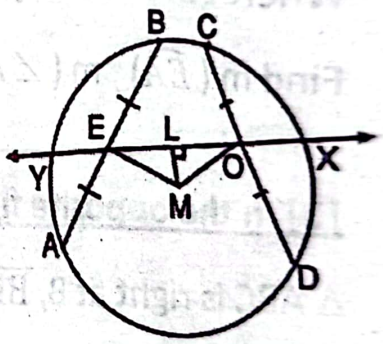
a) 30 b) 75 c) 105 d) 150

[B] In the opposite figure:

$\overline{AB}$, $\overline{CD}$, are two equal chords in the circle M,

O is midpoint of $\overline{CD}$, E is midpoint of $\overline{AB}$,

$\overline{ML} \perp \overline{XY}$, Prove that: OX = EY

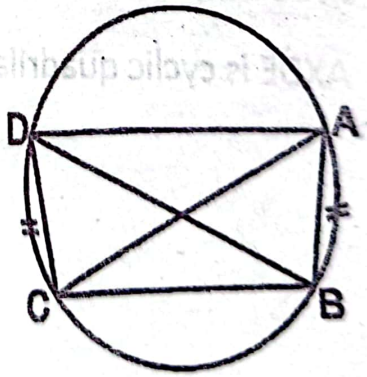


[Q2]

[A] In the opposite figure:

m ($\overset{\frown}{AB}$) = m ($\overset{\frown}{CD}$)

Prove that: $\overline{AD} \parallel \overline{BC}$



[B] Choose the correct answer:

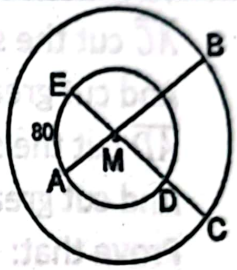
(1) If $\overline{BC}$ is diameter in circle M,
And its radius r, if AB = r, then
m (∠ D) = ...°

a) 30 b) 45 c) 50 d) 60

(2) A circle M of diameter 8 cm, if line L is outside the circle, then the distant between the center M and line L ∈ .....

a)] 4 , ∞ [b) [0 , 4 [c)] 0 , 4 [d) [0 , 4]

(3) In the opposite figure:
Two concentric circles M,
m ($\widehat{EA}$) = 80°
Then m ($\widehat{CB}$) = ...°



a) 40 b) 60 c) 80 d) 160

[Q3] [A] Choose the correct answer:

(1) Number of axes of symmetry of two touching externally circles equals .....

a) 4 b) 2 c) 1 d) Infinite

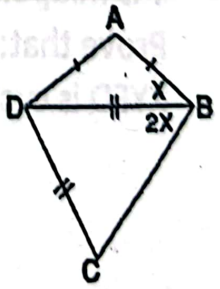
(2) The circumference of circle in which passing through the vertices of a square whose side 6 cm equals .....

a) $6\sqrt{2}\,\pi$ b) $6\,\pi$ c) $12\sqrt{2}\,\pi$ d) $12\,\pi$

(3) The length of the arc is opposite to a central angle of 90° in a circle of radius r is ..... cm

a) $2\,\pi\,r$ b) $\pi\,r$ c) $\frac{1}{2}\,\pi\,r$ d) $4\,\pi\,r$

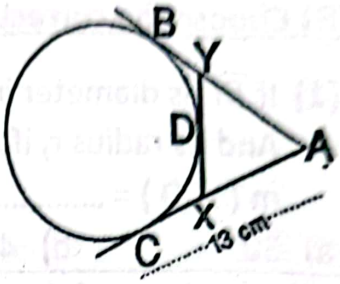
[B] In the opposite figure:



AB = AD, DB = CD
M (∠ ABD) = X°, m (∠ CBD) = (2 X)°
Prove that: ABCD is cyclic quadrilateral

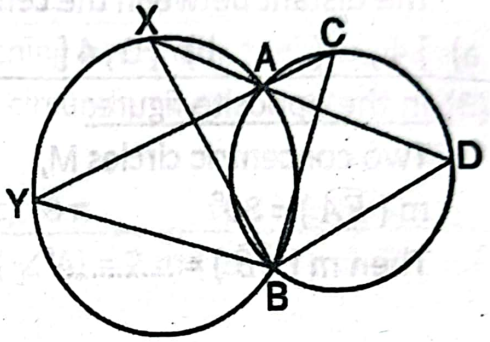
[4] [A] In the opposite figure:

$\overline{AB}$, $\overline{AC}$ are two tangent to the circle
At B,C respectively, $\overline{XY}$ are tangent
to the circle at D, AC = 13 cm
Find the perimeter of Δ AXY



[B] In the opposite figure:

Two intersecting circles
$\overline{AC}$ cut the smaller circle at C
And cut greater circle at Y
$\overline{AD}$ cut the smaller circle at D
And cut greater circle at X
Prove that:
m (∠ CBD) = m (∠ XBY)

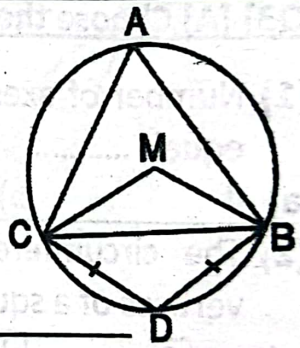


[5] [A] In the opposite figure:

M (∠ BMC) – m (∠ A) = 50°,

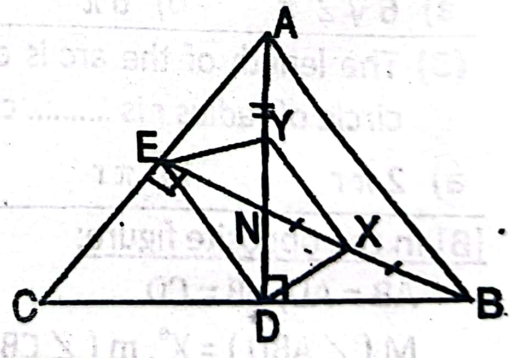
BD = CD,

Find m (∠ A) , m (∠ DBC)



[B] In the opposite figure:

Δ ABC, $\overline{AD} \perp \overline{BC}$, $\overline{BE} \perp \overline{AC}$
X is midpoint of $\overline{BN}$,
Y is midpoint of $\overline{AN}$,
Prove that:
XYED is cyclic quadrilateral



End of the questions

MODEL EXAM NO (1)

[Q1] [A] Choose the correct answer: $\frac{3}{2}=\frac{-5}{k}=\frac{8}{m}$

(1) The two equations $3X - 5Y = 8, 2X + KY = m$ have infinite solution in $R \times R$ when $9Km = \ldots\ldots$ $9 \times \frac{-10}{3} \times \frac{16}{3}$

a) $\frac{-10}{3}$ b) $\frac{16}{3}$ c) -16 d) -160

(2) If the set of zeros of $F(x) = KX + 3$ is $\varnothing$, then $K = \ldots\ldots$

a) -3 b) 3 c) 0 d) 1

(3) The function $n(x) = \frac{x-2}{x-5}$, has an additive inverse in the domain....

a) $R-\{2\}$ b) $R-\{5,-2\}$ c) $R-\{5\}$ d) $R-\{5,2\}$

$n_1 = \frac{3(x-2)}{(x+2)(x-2)}$ $n_2 = \frac{3(x+1)}{(x+2)(x+1)}$

[B] If $n_1(x) = \frac{3x-6}{x^2-4}$, $n_2(x) = \frac{3x+3}{x^2+3x+2}$ prove that $n_1(x) = n_2(x)$ for all the values of X which belongs to the common domain and find this domain? $n_1 = n_2 = \frac{3}{x+2}$, $D = R-\{\pm 2, -1\}$

[Q2] [A] Choose the correct answer: Ms/Randa Hegazy

(1) If S is a sample space of a random experiment, then $P(S') = \ldots\ldots$ $P(\phi)$

a) 1 b) 0 c) -1 d) $\frac{1}{2}$

(2) If $\frac{x-a}{x+3}$ is an algebraic fraction has a multiplicative inverse is $\frac{x+3}{x+5}$ then $a = \ldots\ldots$ $\frac{x-a}{x+3} \times \frac{x+3}{x+5} = 1$

a) -5 b) -3 c) 5 d) 3

(3) If $X^2 + y^2 = 5XY$ then $\frac{x^2}{y^2} + \frac{y^2}{x^2} = \ldots\ldots$ $\div xy$ $25-2 \rightarrow \frac{x}{y}+\frac{y}{x}=5$

a) 32 b) 23 c) -32 d) -23

$x^2 - 2x - 5 = 0 \rightarrow a = 1, b = -2, c = -5$

[B] By using a general formula and find in **R** the solution set of the equation: $-1 - \frac{2}{x} = \frac{5}{x^2}$, approximating the result to nearest two decimal places. $\{-1.45, 3.45\}$

[Q3] Ms/Randa Hegazy

[A] Choose the correct answer:

(1) The two straight lines: X = 3, Y = 5 are ....

a) Parallel c) Coincident

(b) perpendicular d) Intersecting and not perpendicular

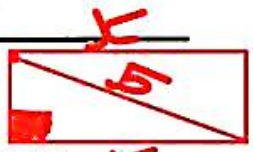
(2) The equation: $\frac{1}{x} + \frac{1}{y} = 3$ in ..... Degree ($x \neq y \neq 0$)

a) First (b) Second c) Third d) Fourth

(3) The number of solution of the equation : $2x - 6 = 0$ in R^2 is ....

a) 1 b) 2 c) 3 (d) infinite

$x^2 + y^2 = 25$, $x + y = 7$



[B] A rectangle of perimeter 14 cm. and its diagonal length 5 cm.

↳ Find its two dimensions? $x = 4$ cm, $y = 3$ cm

---

[4] $3^2 - 3a + 9 = 0 \rightarrow 3a = 18 \rightarrow a = 6$

[A] If the set of zeros of F (X) = $\frac{x^2 - ax + 9}{bx + 4}$ is { 3 }, and its domain R − { 2 }. $b \times 2 + 4 = 0 \rightarrow b = -2$

↳ Find the value of a , b ? $6, -2$

[B] If A, B are two events of the sample space of a random experiment, and $P(A-B)=\frac{5}{12}$, $P(B)=\frac{1}{3}$, $P(A)=P(A')=\frac{1}{2}$

Find: ① probability of occurrence one of them at least $P(A\cup B)=\frac{1}{2}+\frac{1}{3}-\frac{1}{12}=\frac{3}{4}$

② Probability of occurrence event B only. $P(B-A)=\frac{1}{3}-\frac{1}{12}=\frac{1}{4}$

---

[5] [A] Find in the simplest form: $n(X)=\frac{x^2-2x-15}{x^2-9}\div\frac{x^2-25}{x^2-3x}=\frac{(x+3)(x-5)}{(x+3)(x-3)}\times\frac{x(x-3)}{(x+5)(x-5)}=\frac{x}{x+5}$

and showing its domain. If $n(k)=\frac{1}{3}$, $\frac{k}{k+5}=\frac{1}{3}$

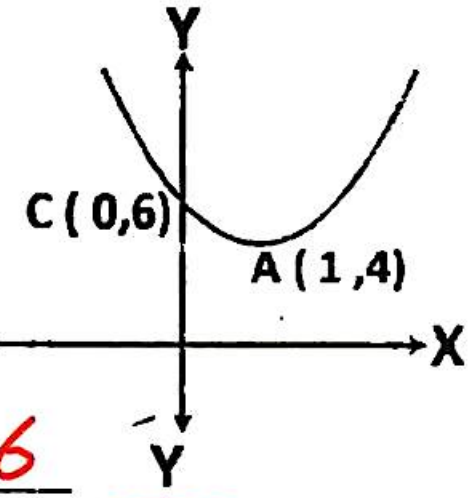
$D=R-\{0,\pm3,\pm5\}$

$3k=k+5$

Find the value of K. $k=\frac{5}{2}$

Ms/Randa Hegazy

[B] In the opposite figure:



The curve of $\mathcal{F}$: $\mathcal{F}(x)=kX^2+mX+n$

Cut y-axis in C (0 , 6) , A (1 , 4)

is the vertex of the curve

Find the value of K, m, n. $2,-4,6$

$(0,6)\rightarrow 0+0+n=6\rightarrow n=6$

End of the questions

$(1,4)\rightarrow k+m+6=4\rightarrow k+m=-2\rightarrow(1)$

The Vertex: $(1,4)\rightarrow\frac{-b}{2a}=1\rightarrow\frac{-m}{2k}=1$

$\therefore -2k-m=0\rightarrow(2)$ by adding (1), (2)

MODEL EXAM NO (2)

[Q1] [A] Choose the correct answer:

(1) If A is an event in a sample space of a random experiment, then $P(A \cup A') =$ ..... P(S)

a) 1 b) 0 c) −1 d) half

(2) The set of zeros of $\mathcal{F}(x) = \frac{x^2-x-2}{x^2-4}$ is ..... $\{-1, 2\} - \{2, -2\}$

a) $\{-1, 2\}$ b) $\{-2, 2\}$ c) $\{-1\}$ d) $\{-2\}$

(3) The intersecting point of the two straight lines:
$3x + y = 0$, $2x = 7y$. lies in ..... (0 , 0) .....

a) First quadrant c) Third quadrant

b) Second quadrant d) On origin point

$x^2 - 6x + 4 = 0 \rightarrow x = \frac{6 \pm \sqrt{6^2 - 4 \times 1 \times 4}}{2 \times 1}$

[B] By using a general formula, find in $\mathcal{R}$ the solution set of the equation $x + \frac{4}{x} = 6$, approximating the result to nearest three decimal places. X(x) $\{0.764, 5.236\}$ Ms/Randa Hegazy

[Q2] [A] Choose the correct answer:

$b^2 - 4ac < 0 \rightarrow 36 - 4 \times a \times 3 < 0 \rightarrow -12a < -36$

(1) If the equation $a x^2 + 6x + 3 = 0$, hasn't real solution then a ..... $a > 3$

a) $]-\infty, 3[$ b) $]3, \infty[$ c) $\{3\}$ d) $\{3, -3\}$

(2) If $\frac{x^2}{x} - \frac{3x}{x} + \frac{1}{x} = 0$, then $x + \frac{1}{x} =$ ..... (where $x \neq 0$) $x - 3 + \frac{1}{x} = 0$

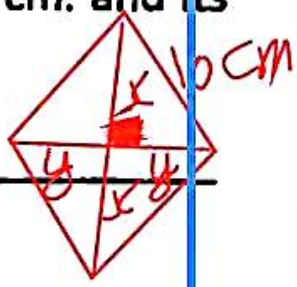
a) 1 b) 3 c) −1 d) −3

(3) If $n(x) = \frac{x^2-x}{x^2-1}$, $n^{-1}(k) = 3$, then K = ... $n^{-1}(K) = \frac{K+1}{K} = 3$

a) $-\frac{3}{2}$ b) $\frac{1}{2}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$

$2x - 2y = 4 \rightarrow x - y = 2$, $x^2 + y^2 = 100$

[B] A rhombus the difference between their diagonal 4 cm. and its perimeter 40 cm. Find the length of its diagonals?



16 cm , 12 cm

5 3]

Ms/Randa Hegazy

[A] Choose the correct answer:

(1) A two digit number, its unit digit = its tens digit = X, then the number is ..... $x + 10x$

a) X^2 b) $2X$ c) $11X$ d) $10X^2$

(2) If n is a function: $n(x) = \frac{x+1}{x-1} + \frac{1-x}{x-1}$, $(x \neq 1)$, then n in the simplest form is .....

a) 0 b) $\frac{2}{2x-2}$ c) $\frac{2}{x-1}$ d) $\frac{2}{(x-1)^2}$

(3) If A, B are two mutually exclusive events from a sample space, then $A \cap B$ = ...

a) $\varnothing$ b) S c) Zero d) 1

[B] If n_1 , n_2 two algebraic fractions, Prove that $n_1 = n_2$?

Where $n_1(x) = \frac{x^2 - x}{x^3 - 2x^2}$, $n_2(x) = \frac{x^2 - 3x + 2}{x^3 - 4x^2 + 4x}$ $D = R - \{0, 2\}$

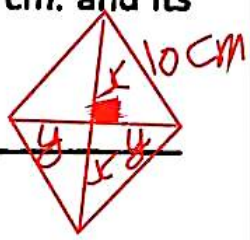
$n_1(x) = \frac{x(x-1)}{x^2(x-2)} = \frac{x-1}{x(x-2)}$, $n_2(x) = \frac{(x-2)(x-1)}{x(x-2)(x-2)} = \frac{x-1}{x(x-2)}$

[Q4]

$2x-2y=4 \rightarrow \{x-y=2\}, \{x^2+y^2=100\}$

[B] A rhombus the difference between their diagonal 4 cm. and its perimeter 40 cm. Find the length of its diagonals?

16 cm , 12 cm



5 [3]

Ms/Randa Hegazy

[A] Choose the correct answer:

(1) A two digit number, its unit digit = its tens digit = X, then the number is ..... $x+10x$

a) X^2 b) $2X$ c) $11X$ d) $10X^2$

(2) If n is a function: $n(x) = \frac{x+1}{x-1} + \frac{1-x}{x-1}$, $(x \neq 1)$, then n in the simplest form is .....

a) 0 b) $\frac{2}{2x-2}$ c) $\frac{2}{x-1}$ d) $\frac{2}{(x-1)^2}$

(3) If A, B are two mutually exclusive events from a sample space, then $A \cap B$ = ...

a) $\varnothing$ b) S c) Zero d) 1

[B] If n_1 , n_2 two algebraic fractions, Prove that $n_1 = n_2$?

Where $n_1(x) = \frac{x^2-x}{x^3-2x^2}$, $n_2(x) = \frac{x^2-3x+2}{x^3-4x^2+4x}$ $D=R-\{0,2\}$

$n_1(x)=\frac{x(x-1)}{x^2(x-2)}=\frac{x-1}{x(x-2)}$, $n_2(x)=\frac{(x-2)(x-1)}{x(x-2)(x-2)}=\frac{x-1}{x(x-2)}$

[Q4]

[A] Find n(x) in the simplest form showing its domain:

$n(x) = \frac{x^2-2x-15}{x^2-9} \div \frac{2x-10}{x^2-6x+9}$ $D=R-\{3,-3,5\}$

$n(x)=\frac{(x+3)(x-5)}{(x+3)(x-3)} \times \frac{(x-3)(x-3)}{2(x-5)}=\frac{x-3}{2}$

$-4+m=0 \rightarrow m=4$, $n(2)=\frac{k}{2-3}+\frac{4}{2+4}=7$

[B] If the domain of $n(x) = \frac{k}{x-3} + \frac{4}{x+m}$ is $\mathcal{R}-\{3,-4\}$, $n(2) = 7$

↳ Find the value of k , m ? $-6\frac{1}{3}$, 4

$-4+m=0 \rightarrow m=4$, $n(2)=\frac{k}{2-3}+\frac{4}{2+4}=7$

[B] If the domain of $n(x)=\frac{k}{x-3}+\frac{4}{x+m}$ is $\mathcal{R}-\{3,-4\}$, $n(2)=7$

↳ Find the value of k , m ? $-6\frac{1}{3}$, 4

[Q5] Ms/Randa Hegazy

[A] If A,B are two events of the sample space of a random experiment, and $P(A)=\frac{1}{2}$, $P(B)=\frac{2}{5}$, $P(A\cap B)=\frac{1}{10}$ Find:

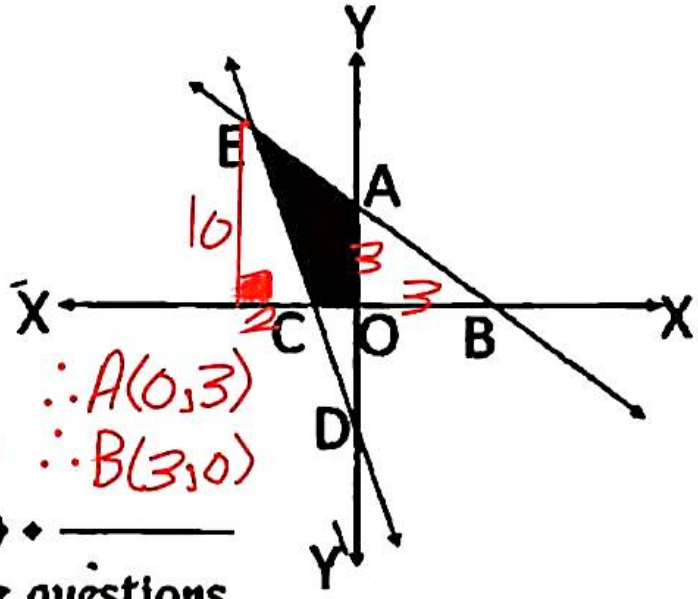
① $P(A\cup B)=\frac{1}{2}+\frac{2}{5}-\frac{1}{10}=\frac{4}{5}$ ② $P(B-A)=\frac{2}{5}-\frac{1}{10}=\frac{3}{10}$

[B] In the opposite figure:

If the equation of $\overleftrightarrow{AB}$: X + Y = 3,

Equation of $\overleftrightarrow{CD}$: 2X + Y +4 = 0

Find the area of the shaded part



① $x+y=3$: at $x=0 \rightarrow y=3$ $\therefore A(0,3)$

at $y=0 \rightarrow x=3$ $\therefore B(3,0)$

End of the questions

② $2x+y+4=0$:

at $y=0 \rightarrow x=-2$

$\therefore C(-2,0)$

③ By solving the equations :

$x+y=3$, $2x+y+4=0$

$\therefore x=-7$, $y=10$ $\therefore E(-7,10)$

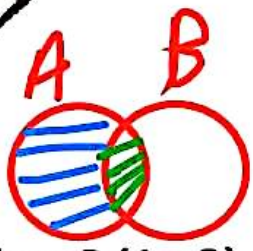
Area $=\frac{1}{2}\times5\times10-\frac{1}{2}\times3\times3$

$=25-\frac{9}{2}$

$=20.5$ square units

7

MODEL EXAM NO (3)



[Q1] A) Choose the correct answer:

(1) If A , B are two events of the sample space of a random P (A∩B), $(A - B) \cup (B \cap A)$ = ...

a) 1 b) S c) B d) A

(2) If the domain of $F(X) = \frac{-2x}{x-5} - \frac{1}{k-x}$ is $R - \{5, -2\}$, then k = ...

a) 2 b) 5 c) −2 d) −5

(3) If AB = 12, BC = 20, AC = 15 where A,B,C $\in R^+$ then ABC= $\sqrt{12 \times 15 \times 20}$

a) 360 b) 3600 c) 60 d) 36

$x^2 - 4x + 4 = 6x \rightarrow x^2 - 10x + 4 = 0$

[B] By using a general formula and, find in R the solution set of the equation: $(X - 2)^2 = 6X$, approximating the result into two decimal places $\{0.42, 9.58\}$

[Q2] A) Choose the correct answer:

$x^2 + 2 = x \rightarrow -x^2 + x = 2$

Ms/Randa Hegazy

(1) If $x + \frac{2}{x} = 1$, then $\frac{x^2+x+2}{x^2(1-x)} = \frac{2x}{2x}$ ..... where $x \neq 0$ ($X(x)$)

a) 1 b) 2 c) −1 d) −2

(2) The two equations X + 4 Y = 7, 3 X + K Y = 21 have infinite solution in R × R when K= .....

$\frac{1}{3} = \frac{4}{K}$

a) 4 b) 7 c) 12 d) 21

(3) If $F(X) = x^2 + a x + 1$, $Z(f) = \varnothing$, then a can be = ...

a) 3 b) 2 c) 1 d) − 2

B): Find F (X) in its simplest form and showing its domain, $D = R - \{3, -2\}$

$$F(x) = \frac{x^2+2x}{x^3-27} \div \frac{x+2}{x^2+3x+9} = \frac{x}{x+3}$$

$$\frac{x(x+2)}{(x-3)(x^2+3x+9)} \times \frac{x^2+3x+9}{x+2}$$

[Q3]

[A] Choose the correct answer:

(1) The two straight lines X = 3 , 3Y = 5 are .....

a) perpendicular c) Parallel

b) Coincide d) Intersecting and not perpendicular

(2) If $n(x) = \frac{x-1}{x-2}$, then the domain of $n^{-1}(x)$ = ...

a) R b) R − {1} c) R − {1, 2} d) R − {2}

(3) If A , B are two events from the sample space of a random experiment, $A \subset B$, then $P(A \cup B)$ = ...

a) Zero b) P (B) c) P (A) d) $P(A \cap B)$

B

[B] If $n_1(x) = \frac{x^3+1}{x^3-x^2+x}$, $n_2(x) = \frac{x^3+x^2+x+1}{x^3+x}$

$$n_1(x) = \frac{(x+1)(x^2-x+1)}{x(x^2+x+1)} = \frac{x+1}{x}$$

$$\frac{x^2(x+1)+(x+1)}{x(x^2+1)} = \frac{x+1}{x}$$

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Show that if $n_1(x) = n_2(x)$ Give the reason? Yes,

$D_1 = D_2 = R - \{0\}$

[Q4] A) If $n(X) = \frac{x^2-2x}{x^2+x-6}$ Find: $n(x) = \frac{x(x-2)}{(x+3)(x-2)} = \frac{x}{x+3}$

① $n^{-1}(x)$ showing its domain $= \frac{x+3}{x}$, $D = R - \{0, 2, -3\}$

② If $n^{-1}(x) = 2$, find the value of X.

$\frac{x+3}{x} = 2 \rightarrow x+3 = 2x \rightarrow x = 3$

Show that if $n_1(x) = n_2(x)$ Give the reason? Yes

$D_1 = D_2 = R - \{0\}$

[Q4] A) If $n(X) = \frac{x^2-2x}{x^2+x-6}$ Find: $n(x) = \frac{x(x-2)}{(x+3)(x-2)} = \frac{x}{x+3}$

① $n^{-1}(x)$ showing its domain $= \frac{yx+3}{x}$, $D = R - \{0, 2, -3\}$

② If $n^{-1}(x) = 2$, find the value of X.

$\frac{x+3}{x} = 2 \rightarrow x+3 = 2x \rightarrow x = 3$

$xy = 28 \rightarrow ①$, $x = y+3 \rightarrow ②$

x
y

[B] If the length of a rectangle exceeds its width with 3 cm, its area 28 cm^2, find its perimeter. $P = (7+4) \times 2 = 22 cm$

by substituting $\rightarrow x = 7$, $y = 4$

[Q5] by adding ①, ② $\rightarrow 5|x| = 5 \rightarrow |x| = 1$

A) Find in $\mathcal{R} \times \mathcal{R}$ the solution set of two equations:

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$2|X| - |Y| = 2$ ① , $3|X| + |Y| = 3$ ②

$\therefore x = 1$ or -1

$\therefore y = 0$

$S.S = \{(1, 0), (-1, 0)\}$

[B] If A , B are two events of the sample space of a random experiment, and $P(A) = P(A') = \frac{1}{2}$, $P(B) = \frac{5}{8} P(A)$, $P(A \cap B) = \frac{1}{16}$,

Find: $P(B) = \frac{5}{8} \times \frac{1}{2} = \frac{5}{16}$

① $P(B)$, $P(A \cup B) = \frac{1}{2} + \frac{5}{16} - \frac{1}{16} = \frac{3}{4}$

② $P(A - B) = \frac{1}{2} - \frac{1}{16} = \frac{7}{16}$

End of the questions

MODEL EXAM NO (4)

10

[Q1] A) Choose the correct answer:

(1) If $n_1(x) = \frac{1}{x-3}$, $n_2(x) = \frac{9}{x+8}$ then the domain of $(n_1 - n_2)$ .....

a) $\{3, -8\}$ b) $R-\{3, -8\}$ c) $R-\{3\}$ d) $R-\{8\}$

(2) If the two equations $X + 2Y = 1$, $2X + aY = 5$ have one solution, then $a \in R - \{$ ..... $\}$

$\frac{1}{2} \neq \frac{2}{a}$

a) 1 b) 2 c) 4 d) -4

(3) If $X + Y = 15$, then $(X - 10)^3 + (Y - 5)^3 =$ .....

$y = 15 - x$

a) 0 b) 25 c) 125 d) 625

[B] Find the value of a, b where $(1, 2)$ is solution of two equations:

$aX + bY + 5 = 0$, $2aX + bY - 2 = 0$

$a + 2b = -5$

by adding ① , ② → $b = -6$, $a = 7$

[Q2] A) Choose the correct answer:

(1) A card is drawn randomly from some cards numbered from 1 to 50, the probability of this card contains a non-perfect square is .....

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a) $\frac{7}{50}$ b) $\frac{43}{50}$ c) $\frac{1}{2}$ d) $\frac{9}{50}$

(2) If $X^2 - Y^2 = 80$, $X - Y = 8$, The mean of the two numbers X and Y is

$\frac{X+Y}{2} = \frac{10}{2}$

a) 2 b) 3 c) 4 d) 5

(3) If $x + \frac{1}{x-2} = 4$, then $(x-2)^2 + \frac{1}{(x-2)^2} =$ ..... where $x \neq 0$

$x - 2 = 4 - 2$

a) -2 b) 2 c) 4 d) 0

$(x-2) + \frac{1}{(x-2)} = (2)^2 \rightarrow (x-2)^2 + 2 + \frac{1}{(x-2)^2} = 4$

$-4+m=0 \rightarrow m=4$

[B] If the domain of $n(x)=\frac{k}{x-3}+\frac{4}{x+m}$ is $R-\{3,-4\}$, $n(2)=7$,

Find the value of k , m ? $n(2)=\frac{k}{2-3}+\frac{4}{2+4}=7$

$k=-6\frac{1}{3}$, $m=4$

[Q3]

[A] Choose the correct answer:

11) The set of zeros of the function F (x) = – 3 X are ..... $-3x=0 \rightarrow x=0$

a) { Zero } b) { 3 } c) { – 3 } d) R – { 3 }

(2) The simplest form of the function $n(x)=\frac{3-x}{x-3}$, where $X \in R-\{3\}$ is .....

$n(x)=\frac{-(x-3)}{x-3}$

a) 1 b) –1 c) 3 d) – 3

(3) If $n(x)=\frac{x-3}{x+2}$, then the domain of $n^{-1}(x)$ = ...

a) $\{-2,3\}$ b) $R-\{-2,3\}$ c) $R-\{-2\}$ d) $R-\{3\}$

y x

$4x-4y=12 \rightarrow x-y=3 \rightarrow x=y+3$ (1)

[B] The difference between the perimeter of two squares 12 cm. and the difference between the areas of two squares 33 cm^2. Find the length of side of each square?

$x^2-y^2=33$ (2) by substituting

$x=7cm$, $y=4cm$

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[4] $D=R-\{3,-3\}$

[A] Find n (x) in the simplest form and showing its domain:

$$n(x)=\frac{x^2+3x+9}{x^3-27}-\frac{x^2-x-12}{9-x^2}=1$$

$$n(x)=\frac{x^2+3x+9}{(x-3)(x^2+3x+9)}-\frac{(x-4)(x+3)}{-(x-3)(x+3)}=\frac{1+x-4}{x-3}=1$$

Math questions bank The Third preparatory

$x=\frac{-2\pm\sqrt{4-4\times1\times-5}}{}$ $a=1$

$x = \frac{-2 \pm \sqrt{4 - 4 \times 1 \times -5}}{2 \times 1}$ $a=1$ $b=2$ $c=-5$

[B] By using a general formula: $x^2 + 2x - 5 = 0$

Find in $\mathcal{R}$ the solution set of the equation $\frac{5}{x^2} - \frac{2}{x} = 1$, approximating the result to nearest three decimal places. Where

$x = \frac{-2 \pm \sqrt{24}}{2} = -1 \pm \sqrt{6}$

$\sqrt{6} = 2.45$ $\{1.45 , -3.45\}$

[Q5] $n(x) = \frac{x^2 + x + 1}{(x-1)(x^2+x+1)} \times \frac{(x-1)(x-1)}{x(x-1)} = \frac{1}{x}$

[A] Find n (x) in the simplest form and showing its domain $D = R - \{1, 0\}$

$$n(x) = \frac{x^2+x+1}{x^3-1} \div \frac{x^2-x}{x^2-2x+1} = \frac{1}{x}$$

[B] If A , B are two events of the sample space of a random experiment, and $P(A \cap B) = 0.2$, $P(A - B) = 0.3$, $P(B - A) = 0.4$

Find: ① $P(B) = 0.6$

② $P(B \cup A) = 0.9$

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① $P(B - A) = P(B) - P(A \cap B) \rightarrow 0.4 = P(B) - 0.2$

$\therefore P(B) = 0.6$ End of the questions

② $P(A - B) = P(A) - P(A \cap B) \rightarrow 0.3 = P(A) - 0.2$

$\therefore P(A) = 0.5$

$\therefore P(B \cup A) = P(A) + P(B) - P(A \cap B) = 0.5 + 0.6 - 0.2 = 0.9$

MODEL EXAM NO (5)

[Q1] A) Choose the correct answer:

(1) If intersection point of two lines $X-1=0$, $Y-2k=0$ lies in fourth quadrant then k may be .....

a) -5 b) 0 c) 1 d) 5

(2) The domain of the additive inverse of $n(x)=\frac{x}{x-3}$ is .....

a) R b) $R-\{0\}$ c) $R-\{3\}$ d) $R-\{0,3\}$

(3) If : $X^2=Y+Z$, $Y^2=Z+X$, $Z^2=X+Y$ then $\frac{1}{x+1}x+\frac{1}{y+1}y+\frac{1}{z+1}z=$ .....

a) -1 b) 1 c) 2 d) 4

B): By using a general formula, find in R the solution set of the equation $X+\frac{4}{x}=6$, approximating the result to three decimal place.

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[Q2] A) Choose the correct answer:

(1) If A is an event of the sample space of a random experiment, and $P(A)=4P(\acute{A})$ then $P(A)=$ .....

a) 0.8 b) 0.6 c) 0.4 d) 0.2

(2) The degree of the equation $XY=3$ is .....

a) First b) Second c) Third d) zero

(3) If $x(3-\frac{2}{x})=\frac{3}{x}$, then $(x)^2+\frac{1}{(x)^2}=$ ..... where $x\neq 0$

a) $2\frac{1}{9}$ b) $2\frac{4}{9}$ c) $3\frac{1}{9}$ d) $3\frac{4}{9}$

[B] If the area of rectangle 77 cm^2, if its length decreased by 2 cm and its width increased by 2 cm, it will be a square. Find the area of square.

$x = 11$, $y = 7$ ← $\begin{cases} xy = 77 \rightarrow (1) \\ x - 2 = y + 2 \\ x = y + 4 \rightarrow (2) \end{cases}$

x	y

$A = 9 \times 9 = 81\ cm^2$

[Q3]

[A] Choose the correct answer:

(1) If $n(x) = \frac{x-2}{x+5}$, then the domain of $n^{-1}(x)$ = ...

a) R b) $R - \{2\}$ c) $R - \{-5\}$ d) $R - \{2, -5\}$

(2) If A , B are two mutually exclusive events from the sample space of a random experiment, then P (A – B) = ...

a) P (B) b) P (A) c) 0 d) 1

(3) If $F(x) = \frac{7+x}{7-x}$, where $X \in R - \{\pm 7\}$, then $F(-2)$ = ... $\frac{5}{9}$

a) $\frac{-1}{f(-2)}$ $-\frac{9}{5}$ b) $\frac{-1}{f(2)}$ $-\frac{5}{9}$ c) $\frac{1}{f(2)}$ $\frac{5}{9}$ d) $\frac{1}{f(-2)}$ $\frac{9}{5}$

[B] n_1 , n_2 two algebraic fractions, $n_1(x) = \frac{x^2-4}{x^2+x-6}$, $n_1(x) = \frac{(x+2)(x-2)}{(x+3)(x-2)}$, $n_2(x) = \frac{x(x-3)(x+2)}{x(x+3)(x-3)}$

$n_2(x) = \frac{x^3-x^2-6x}{x^3-9x}$, prove that $n_1(x) = n_2(x)$ For all values of x in common domain and Find this domain ?

$n_1(x) = n_2(x) = \frac{x+2}{x+3}$, Domain $= R - \{0, 2, \pm 3\}$

[Q4]

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[A] Find n(x) in the simplest form showing its domain:

$$n(x) = \frac{x^2-2x}{x^4-3x^3+2x^2} \times \frac{4-x^2}{x^2+x-2} = \frac{x(x-2)}{x^2(x-2)(x-1)} \times \frac{-(x+2)(x-2)}{(x+2)(x-1)}$$

$D = R - \{0, 1, 2, -2\}$

↳ Find the S.S when n (x) =0 $\emptyset$

$n(x) = \frac{-(x-2)}{(x-1)^2} = \frac{0}{1} \rightarrow x - 2 = 0 \rightarrow x = 2 \in$ Domain

[B] If A , B are two events of the sample space of a random experiment, and $P(B)=\frac{1}{3}$, $P(A-B)=\frac{1}{4}$, find P (A) if:

① $P(A \cap B)=\frac{1}{12}$ $\frac{1}{4}=P(A)-\frac{1}{12} \rightarrow P(A)=\frac{1}{3}$

② $B \subset A$ $\frac{1}{4}=P(A)-\frac{1}{3} \rightarrow P(A)=\frac{7}{12}$

[Q5] $n(x)=\frac{(x+3)(x-5)}{(x+3)(x-3)} \times \frac{x(x-3)}{(x+5)(x-5)}=\frac{x}{x+5}$

[A] Find n (x) in the simplest form showing its domain:

$D=R-\{0,\pm3,\pm5\}$ $n(x)=\frac{x^2-2x-15}{x^2-9} \div \frac{x^2-25}{x^2-3x}=\frac{x}{x+5}$

$n(A)=\frac{A}{A+5}=\frac{1}{3} \rightarrow 3A=A+5 \rightarrow 2A=5 \rightarrow A=\frac{5}{2}$ ↳ Find the value of A if $n(A)=\frac{1}{3}$

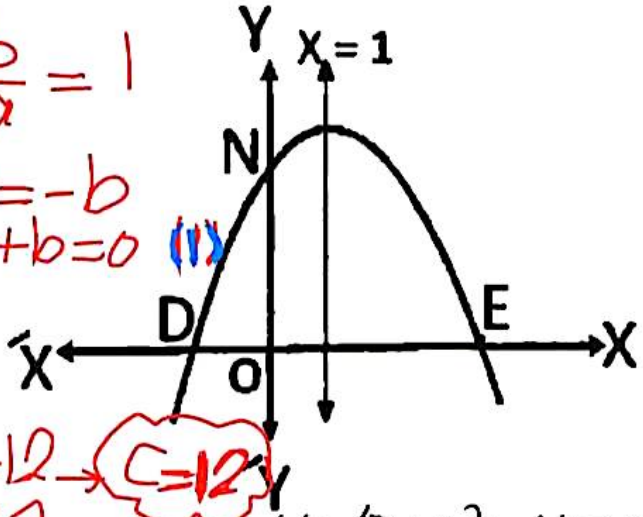
[B] In the opposite figure:

The quadratic curve of $\mathcal{F}$: $\frac{-b}{2a}=1$

$\mathcal{F}(x)=aX^2+bX+c$ $2a=-b$, $2a+b=0$ (1)

The axis of symmetry is $X=1$

N (0,12) , E (3,0) Find $\mathcal{F}(x)$



$N(0,12) \rightarrow f(0)=0+0+c=12 \rightarrow c=12$

$E(3,0) \rightarrow f(3)=9a+3b+12=0$

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End of the questions

$\therefore 3a+b=-4$ (2)

Solving equations (1), (2) $\rightarrow a=-4$, $b=8$

$\therefore f(x)=-4x^2+8x+12$

MODEL EXAM NO (6)

[Q1] A) Choose the correct answer:

(1) The two equations X + 4 Y = m , 3 X + K Y = 21 have infinite solution in R × R when K + m = ...

a) 19 b) 20 c) 21 d) 22

(2) If : $X^2 - 4x - 1 = 0$, then $3x - \frac{3}{x}$ = ...

a) 2 b) 3 c) 4 d) 12

(3) If a coin tossing once, the probability of appearing head or tail equal.....

a) 100 % b) 50 % c) 25 % d) 0

[B] By using a general formula, find in R the solution set of the equation $\frac{x^2}{9} + \frac{4}{3}x = -2$, approximating the result to nearest three decimal places.

[Q2] A) Choose the correct answer:

(1) The common domain of $\frac{2}{x^2-1}$, $\frac{5x}{x^2-x}$ is .....

a) R − {1} b) R − {0 , 1} c) R − {−1 , 1} d) R − {0 , 1 , −1}

(2) If $2^{x+y} = 32$, $3^x = 9$ then $(x)^y$ = ...

a) $\frac{1}{8}$ b) 8 c) $\frac{1}{9}$ d) 9

(3) If the domain of $n(x) = \frac{x+b}{x+a}$ is R − { − 2 } , n (0) = 3, then the value of a + b = ...

a) 2 b) 6 c) 8 d) 10

[B] Find in R × R solution set of two equations: $X + Y = 2$, $\frac{1}{x} + \frac{1}{y} = 2$ where $X \neq 0$, $Y \neq 0$

[Q3]

[A] Choose the correct answer:

(1) If the curve of the quadratic function F passing through the points (2, 0), (−3, 0), (0, −6), then the solution set of the function F(X) = 0 in R is .....

a) {−2, 3} b) {3, 2} c) {2, −3} d) {−3, −6}

(2) The simplest form of the function $n(x) = \frac{3-x}{x-3}$, where $X \in R - \{3\}$ is .....

$\frac{-(x-3)}{x-3}$

a) 1 b) −1 c) 3 d) −3

(3) If A is an event from the sample space, then $P(A') =$ .....

a) 1 b) −1 c) 1 − P(A) d) P(A) − 1

[B] If A, B are two events of the sample space of a random experiment, and P(A) = 0.6, P(B) = 0.7, P(A∩B) = 0.4, Find:

$(A \cap B)' = 1 - P(A \cap B) = 1 - 0.4 = 0.6$

① The probability of non-occurrence of A, B together.

② The probability of occurrence at least one of them.

$P(A \cup B) = 0.6 + 0.7 - 0.4 = 0.9$

[Q4]

$n(x) = \frac{x-6}{(2x-3)(x-6)} + \frac{x-5}{(2x-3)(x-5)}$

[A] Find n(x) in the simplest form and showing its domain:

$D = R - \{6, \frac{3}{2}, 5\}$ $n(x) = \frac{x-6}{2x^2-15x+18} + \frac{x-5}{15-13x+2x^2} = \frac{2}{2x-3}$

$D = R - \{0\}$

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[B] n_1, n_2 two algebraic fractions, $n_1(x) = \frac{x^3+1}{x^3-x^2+x}$, $n_2(x) = \frac{(x^3+x^2)+(x+1)}{x^3+x}$

↳ Show that if $n_1 = n_2$ or not with giving the reason $n_1 = n_2$

$n_1(x) = \frac{(x+1)(x^2-x+1)}{x(x^2-x+1)} = \frac{x+1}{x}$, $n_2(x) = \frac{x^2(x+1)+(x+1)}{x(x^2+1)} = \frac{x+1}{x}$

[Q5]

[A] Find n(x) in the simplest form showing its domain:

$$n(x) = \frac{x^2-2x-15}{x^2-9} + \frac{2x-10}{x^2-6x+9}$$

$D = R - \{\pm 3, 5\}$

$$n(x) = \frac{(x+3)(x-5)}{(x+3)(x-3)} \div \frac{2(x-5)}{(x-3)(x-3)} = \frac{x-3}{2}$$

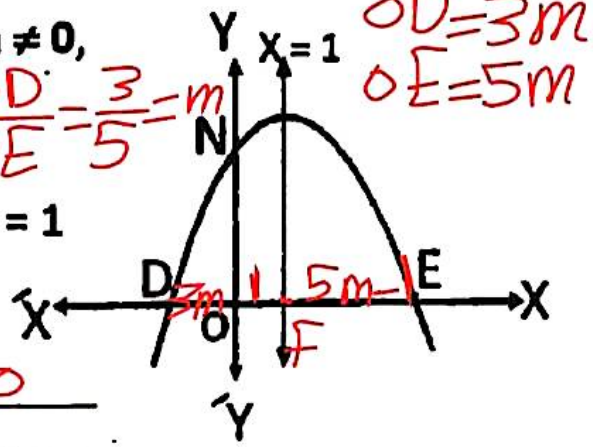
[B] The opposite figure represents the curve

Of function $\mathcal{F}$: $\mathcal{F}(x) = a x^2 + b x + c$, $a \neq 0$,

If OK = 30 unit length, 5 OD = 3 OE $\frac{OD}{OE} = \frac{3}{5} = m$

And equation of line of symmetry is X = 1

Find the value of a , b , c



$OD = 3m$

$OE = 5m$

$N(0, 30) \rightarrow f(0) = 0 + 0 + C = 30$

$\therefore C = 30$

End of the questions

$x = 1 \rightarrow \frac{-b}{2a} = 1 \rightarrow 2a = -b$ (1)

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$\because FE = FD \rightarrow 5m - 1 = 3m + 1 \rightarrow 2m = 2$

$\therefore m = 1 \rightarrow OD = 3$, $OE = 5$

$\therefore E(5, 0)$, $D(-3, 0)$

at $(5, 0) \rightarrow f(5) = 25a + 5b + 30 = 0$

$\therefore 5a + b = -30$ (2)

Solving equations (1) , (2) $\rightarrow a = -2$

$b = 4$

MODEL EXAM NO (7)

[Q1] [A] Choose the correct answer:

(1) A circle of radius 4 cm and its center is origin point, which of the following points not belong to the circle?

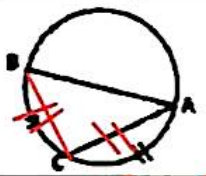
a) (0, 4) b) (4, 0) c) (0, −4) d) (4, 4)

(2) If straight line L lies outside circle of diameter 10 cm, and the distance between L and center of circle is X, then X ∈ .....

a) [0, 5] b)]0, 5[c) [0, 5[d)]5, ∞[

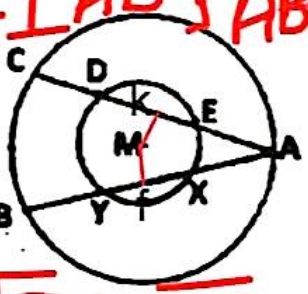
(3) In the opposite figure: Ms/Randa Hegazy
C is midpoint of $\overset{\frown}{AB}$, Then AB .... 2 AC

a) > b) < c) ≥ d) =



[B] In the opposite figure: Two concentric circles at M, $\overline{AB}$ is chord in greater circle and cut smaller circle at X, Y, $\overline{AC}$ is chord in greater circle cut smaller circle in D, E, if AB = AC

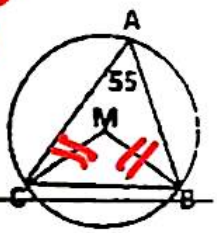
↳ **Prove that:** DE = XY



[Q2] [A] Choose the correct answer:

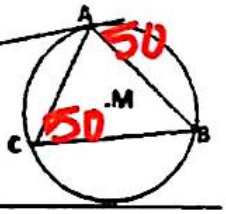
(1) In the opposite figure:
M(∠A) = 55°, m (∠(MCB) = ...

a) 180 b) 90 c) 100 d) 110



(2) In the opposite figure:
$\overrightarrow{AD}$ is tangent to circle M at A,
m(∠DAB) = 130°, Then m(∠C) = ...°

a) 50 b) 65 c) 130 d) 260



(3) We can't draw circle passing through vertices of .....

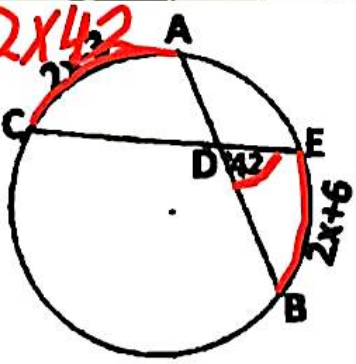
a) Parallelogram b) Square c) Rectangle d) Isosceles trapezium

[B] In the opposite figure: $2x+6+3x-2=2\times42$

$\overline{AB} \cap \overline{EC} = \{D\}$, $m(\angle EDB) = 42°$ $5x+4=84$

$M(\overset{\frown}{EB}) = (2X+6)°$, $m(\overset{\frown}{AC}) = (3X-2)°$

Find the value of X? $5x=80$, $x=16$



[Q3] [A] Choose the correct answer: Ms/Randa Hegazy

(1) Sum of the interior angles of the cyclic quadrilateral is .....°

a) 90 b) 180 c) 360 d) 720

(2) The length of the arc whose opposite to half circle = ... $\frac{1}{2}(2\pi r)$

a) $2\pi r$ b) πr c) $\frac{1}{2}\pi r$ d) $\frac{1}{3}\pi r$

(3) If ABCDEF is a regular hexagon drawn inside a circle, then $m(\overset{\frown}{AB})$ = ... $360 \div 6$

a) 60 b) 90 c) 180 d) 360

[B] In the opposite figure: $m(\angle DBC) = 180° - 110° = 70°$

$\overline{AB}$, $\overline{AC}$ are two tangents at B, C

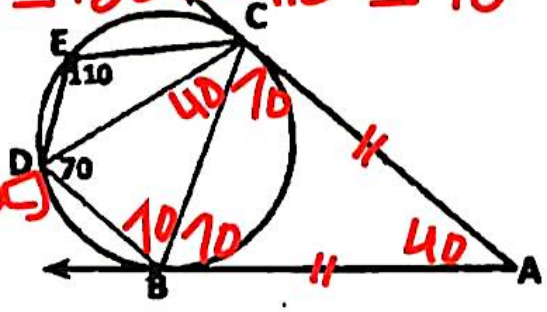
$m(\angle E) = 110°$, $m(\angle BDC) = 70°$

Prove that: $m(\angle ABC) = m(\angle BDC) = 70°$

① $\overline{BC}$ bisects $\angle ABD$

② $\overline{CD}$ is tangent to circle passes through vertices of ΔABC

$m(\angle A) = m(\angle BCD) = 40°$



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[4] [A] In the opposite figure:

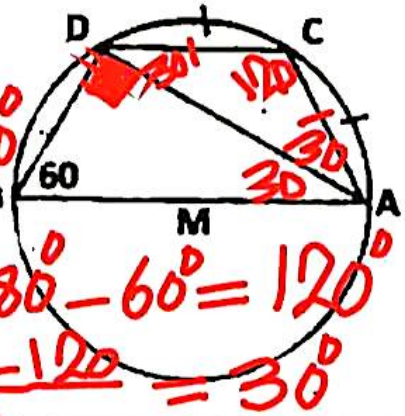
ABCD is cyclic quadrilateral, $\overline{AB}$ is diameter

in circle M, $m(\angle B) = 60°$ $m(\angle ADB) = 90°$

Length of $\overset{\frown}{AC}$ = length of $\overset{\frown}{CD}$ $m(\angle DAB) = 30°$

Prove that: $\overline{AD}$ bisects $\angle BAC$ $m(\angle ACD) = 180° - 60° = 120°$

$AC = DC \rightarrow m(\angle CAD) = \frac{180-120}{2} = 30°$



[B] XYZL is a Parallelogram, $\angle X$ is acute angle, $F \in \overrightarrow{ZL}$, $F \notin \overline{ZL}$ where $YF = XL$. **Prove that** XYLF is cyclic quadrilateral.

$m(\angle Z) = m(\angle YXL)$, $m(\angle Z) = m(\angle YFL)$

$\therefore m(\angle YXL) = m(\angle YFL)$ drawn on $\overline{YL}$

[Q5] $m(\angle ADB) + m(\angle XEB) = 180^\circ$

[A] In the opposite figure: XEBD cyclic quad

$\overrightarrow{AB}$ is diameter in circle M,

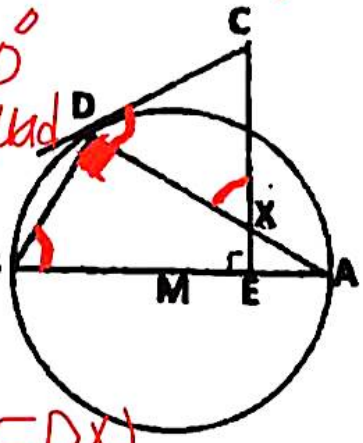
$\therefore m(\angle CXD) = m(\angle DBA)$

$\overline{CD}$ is tangent to circle D

$\because m(\angle DBA) = m(\angle CDX)$

If $\overline{CE} \perp \overline{AB}$, prove that: CX = CD

$\therefore m(\angle CXD) = m(\angle CDX)$



[B] In the opposite figure: Ms/Randa Hegazy

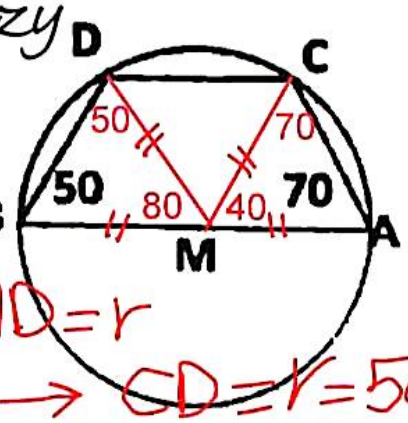
$\overline{AB}$ is diameter in circle M, its radius is 5 cm,

$m(\angle B) = 50°$, $m(\angle A) = 70°$,

↳ Find the length of $\overline{CD}$

$m(\angle CMD) = 180 - (80 + 40) = 60$, $MC = MD = r$

$\triangle MDC$ equilateral Triangle → $CD = r = 5cm$



End of the questions

MODEL EXAM NO (8)

[Q1] A) Choose the correct answer:

360 ÷ 4

(1) If ABCD is square drawn in a circle, then m ($\overset{\frown}{AB}$) = ...°

a) 60 b) 90 c) 120 d) 180

(2) Number of common tangent for two touching internally circles is

a) 1 b) 2 c) 3 d) Zero

(3) Center of all circles passes through two points A , B lies on .....

a) $\overline{AB}$ b) Axis of $\overline{AB}$

c) Midpoint of $\overline{AB}$ d) Perpendicular on axis of $\overline{AB}$

$m(\angle DME) = 360 - (90 + 90 + 120) = 60^\circ$

B): In the opposite figure:

$\therefore m(\angle FML) = 60^\circ$

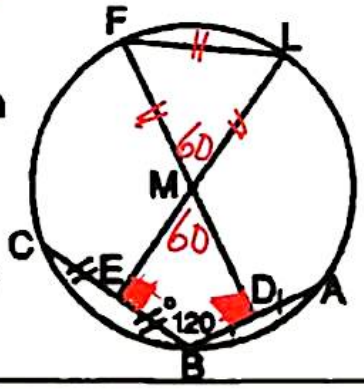
$MF = ML = r$

$\overline{AB}$, $\overline{AC}$ are two chords in circle M of radius 7 cm

$\therefore \Delta MFL$ equilateral

, D, E midpoints of $\overline{AB}$, $\overline{AC}$, m(∠BAC) = 120°,

Draw $\overrightarrow{DM}$, $\overrightarrow{EM}$ cut circle in F, L find length of $\overline{LF}$



$LF = r = 7$ cm

[Q2] A) Choose the correct answer:

$r = \sqrt{\text{area}}$ $> r$

(1) Circle of area X π cm², straight line L of distant (X + 1) cm form its center, then L lies ..... Circle

a) Outside the b) Secant of c) Tangent of d) Axis of

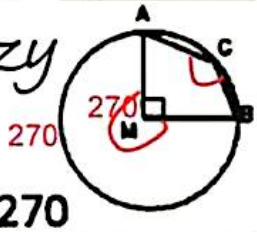
(2) In the opposite figure:

$\overline{MA} \perp \overline{MB}$,

Then m(∠ACB) = ...°

Ms/Randa Hegazy

$\frac{1}{2} \times 270^\circ$



a) 90 b) 135 c) 110 d) 270

(3) The center of circumcircle of a triangle is intersection point of ....

a) Medians c) Axes of its sides

b) Altitudes d) Bisectors of its angles

B): In the opposite figure:

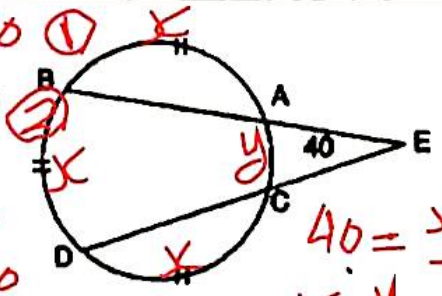
M $(\overset{\frown}{AB})$ = m $(\overset{\frown}{DB})$ = m $(\overset{\frown}{DC})$

M (∠ C) = 40°, **find** m $(\overset{\frown}{AC})$

$3x+y=360$ ① $x-y=80$ ② by adding: $x=110°$ $y=30°$

$m(\overset{\frown}{AC})=30°$

$40=\frac{x-y}{2}$ $x-y=80$



[Q3] Ms/Randa Hegazy

[A] Choose the correct answer:

(1) Number of symmetric axes of two touching circles externally is...

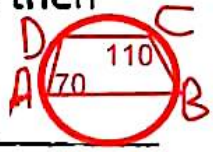
a) 0 b) 1 c) 2 d) ∞

(2) If point A lies on surface of circle M and length of its diameter is 6 cm, then m ∈ .....

$r=3$

a) $]-\infty, 6]$ b) $]-\infty, 3]$ c) $[0, 3]$ d) $]3, \infty[$

(3) ABCD is a quadrilateral inscribed in a circle, m(∠A) = 70°, then m(BAD) = ... $2\times 110°$



a) 35 b) 55 c) 140 d) 220

[B] In the opposite figure:

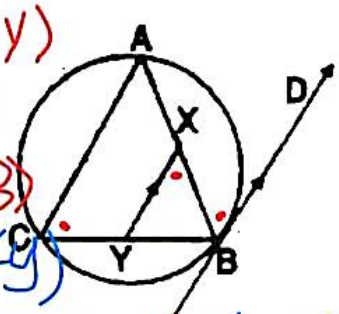
ABC is triangle drawn in a circle, $\overrightarrow{BD}$ is tangent, $\overline{BD} \parallel \overline{XY}$

Prove that: AXYC is cyclic quadrilateral.

$\therefore m(\angle ABD)=m(\angle BXY)$ (alternate)

$\therefore m(\angle ADB)=m(\angle ACB)$ (inscribed, tangency)

$\therefore m(\angle BXY)=m(\angle ACB)$ (exterior)



[Q4] $\triangle ABM$ Thirty-Sixty triangle

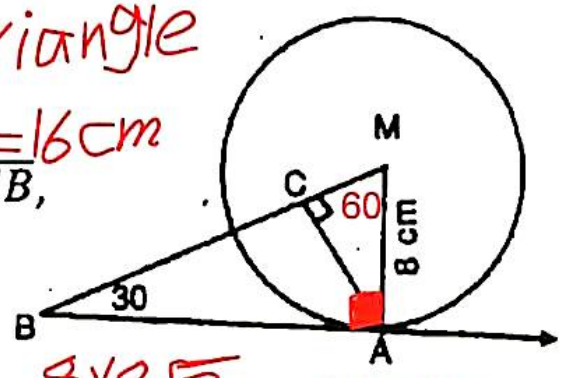
[A] In the opposite figure:

$\therefore MB=2MA=2\times 8=16$ cm

$\overrightarrow{BA}$ is tangent of circle M at A, $\overline{AC} \perp \overline{MB}$,

MA = 8 cm, m (∠B) = 30°

Find the length of $\overline{AB}$, $\overline{AC}$



$AB=\sqrt{16^2-8^2}=8\sqrt{3}$ → $AC=\frac{8\times 8\sqrt{3}}{16}=4\sqrt{3}$ cm

$m(\angle MXY) = m(\angle MYA) = 90^\circ$ (drawn on $\overline{MA}$)

[B] In the opposite figure:

$\therefore AYXM$ cyclic quad.

X is midpoint of $\overline{AC}$, Y is midpoint of $\overline{AB}$

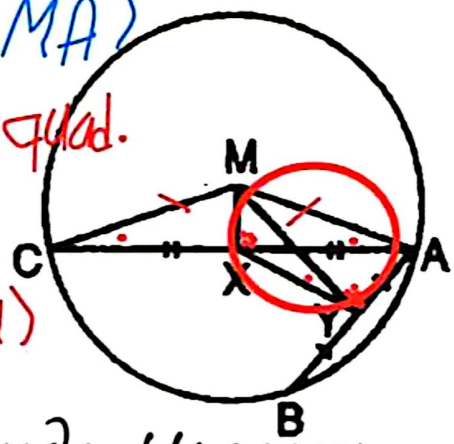
$\therefore m(\angle MAX) = m(\angle MYX)$

① Prove that: m (∠ MYX) = m (∠ MCX)

$\because MA = MC \quad \therefore m(\angle MAX) = m(\angle MCX)$

② $\overline{AM}$ is diameter in circle passes A , Y , X , M

$m(\angle MXA) = 90^\circ$ Ms/Randa Hegazy



[Q5] $\angle DAB$ exterior of $\triangle DAE$

$\therefore m(\angle DAB) > m(\angle E)$

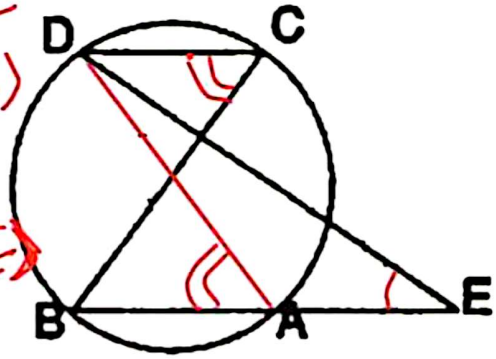
[A] In the opposite figure:

$\because m(\angle DCB) = m(\angle DAB)$

E is a point outside the circle

$\therefore m(\angle DCB) > m(\angle E)$

Prove that: m(E) < m (BCD)



$m(\angle E) + m(\angle ECD) + m(\angle EDC) = 180^\circ$

[B] In the opposite figure:

$\because m(\angle ECD) = m(\angle ABC)$

M , N are two circles intersecting at A, B

$\therefore m(\angle EDC) = m(\angle ABD)$

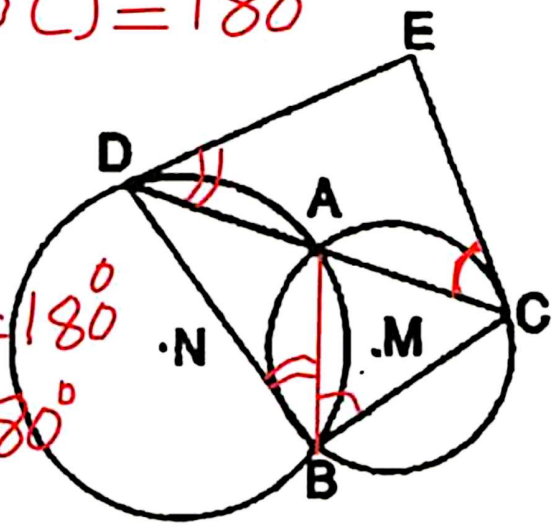
$\overleftrightarrow{EC}$ is tangent of circle M at C,

$\therefore m(\angle E) + m(\angle ABC) + m(\angle ABD) = 180^\circ$

$\overleftrightarrow{DC}$ is tangent of circle N at D

$\therefore m(\angle E) + m(\angle CBD) = 180^\circ$

Prove that ECBD is cyclic quadrilateral



End of the questions

□

MODEL EXAM NO (9)

[Q1] A) Choose the correct answer:

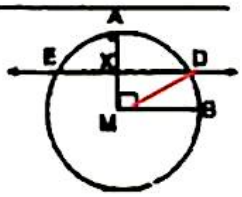
(1) If the circumference of circle 36 cm, then measure of an arc of length 6 cm = ... °

a) 30 b) 60 c) 90 d) 120

(2) A circle M of diameter 8 cm, A point inside it, if MA = (3X–2) cm then X ∈ .....

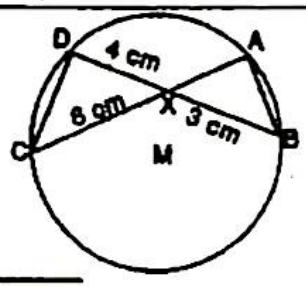
a) $]-\infty, 2[$ b) $[\frac{2}{3}, 2[$ c) $]\frac{2}{3}, 6]$ d) $[2, \infty[$

(3) In the opposite figure:
$\overline{MA}$, $\overline{MB}$ two perpendicular radii
$\overleftrightarrow{DE}$ is axis of $\overline{MA}$, then m($\angle\widehat{BD}$) = ...°



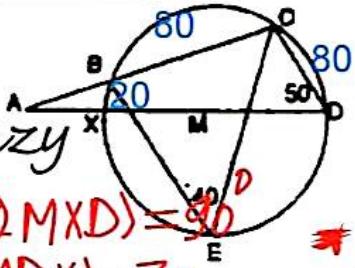
a) 30 b) 45 c) 90 d) 135

[B] In the opposite figure:
$\overline{AC} \cap \overline{DB}$ = {X}, XC = 6 cm
XD = 4 cm, XB = 3 cm
Find length of $\overline{AX}$



[Q2] A) Choose the correct answer:

(1) In the opposite figure:
DX is diameter in circle M
M($\angle$E) = 40°, then m($\angle$A) = ...



a) 20 b) 30 c) 40 d) 50

(2) We can't draw a circle passing through A, B and AB = 8 cm if its radius ..... cm

a) 3 b) 4 c) 7 d) 8

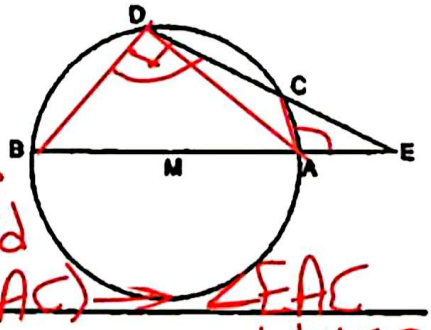
(3) The axis of symmetry of common chord AB for intersecting circle at A, B is .....

a) $\overleftrightarrow{MA}$ b) $\overleftrightarrow{MB}$ c) $\overleftrightarrow{MN}$ d) $\overleftrightarrow{AN}$

[B] In the opposite figure:

$\overline{AB}$ is diameter in circle M, $\overrightarrow{BA} \cap \overrightarrow{DC} = \{E\}$

Prove that: EC > EA



$m(\angle ADB) = 90°$ by adding $\angle ADE$

$\angle BDC$ obtuse angle

ABDC cyclic quad

$m(\angle BDC) = m(\angle EAC)$ → $\angle EAC$ obtuse

[Q3] Ms/Randa Hegazy

[A] Choose the correct answer:

(1) Number of axes of symmetry of two touching externally circles is.....

a) Zero b) 1 c) 2 d) Infinite

(2) A chord of 8 cm in a circle of radius 5 cm, then its distance from center ..... Cm

$\sqrt{5^2-4^2}$

a) 1 b) 2 c) 3 d) 4

(3) ABCD is a cyclic quadrilateral, m (∠A) = 70°, then m (∠BAD)=..... by ∠

a) 35 b) 55 c) 140 d) 220

[B] In the opposite figure: $\overrightarrow{XM}$ bisects $\angle X$, $\overrightarrow{YM}$ bisects $\angle Y$

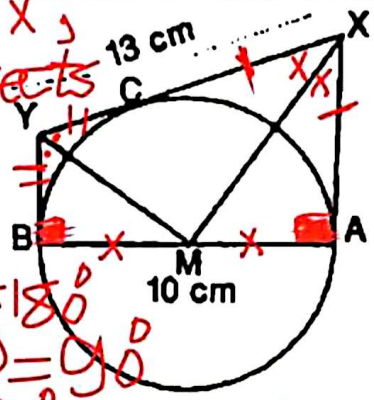
$\overline{AB}$ is diameter in circle M, AB = 10 cm

If C ∈ circle M, draw a tangent at C

cut two tangents are drawn at A, B in X , Y, XY = 13 cm.

① **Prove that:** $\overline{XM} \perp \overline{YM}$

② **Find** area of AXYB



$\because \overline{AX} // \overline{BY}$

$\therefore m(\angle X) + m(\angle Y) = 180°$

$\therefore m(M\hat{X}Y) + m(M\hat{Y}X) = 90°$

$\therefore m(\angle XMY) = 90°$

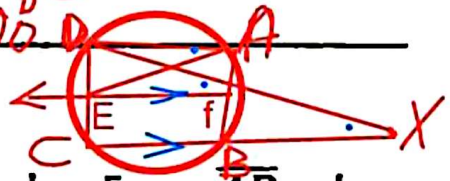
$A = \frac{1}{2}(AX + BY) \times AB$

$= \frac{1}{2} \times 13 \times 10 = 65\ cm^2$

[A] ABCD is a quadrilateral drawn in a circle, F ∈ $\overline{AB}$, draw $\overrightarrow{FE} // \overrightarrow{BC}$ and cut $\overline{CD}$ in E, $\overrightarrow{DF} \cap \overrightarrow{CB} = \{X\}$

Prove that: ① AFED is cyclic quadrilateral

② m (∠BXF) = m (∠ EAD)



① ∵ ABCD cyclic quad.

$\therefore m(\angle C) + m(\angle A) = 180°$

$\because m(\angle C) = m(\angle DEF)$

$\therefore m(\angle DEF) + m(\angle A) = 180°$

② $m(\hat{EAD}) = m(\hat{EFD})$

$m(\hat{EFD}) = m(\hat{BXF})$

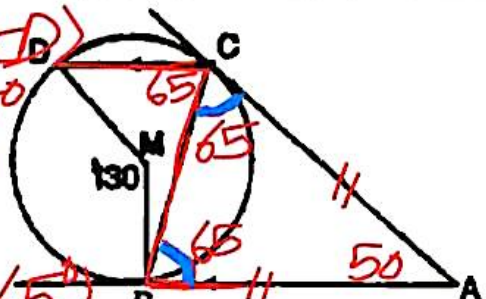
B) In the opposite figure: m(ABC) = m(BCD)

$\overline{AB}$, $\overline{AC}$ are two tangents for circle M = 65°

$\overline{AB}$ // $\overline{CD}$, m(∠BMD) = 130° (alternate)

① **Prove that:** CB bisects ∠ACD

② **Find by prove** m (∠A) 180° − (65° + 65°) = 50°



[Q5] Ms/Randa Hegazy

[A] In the opposite figure: 360° − (90 + 90 + 60) = 120

Two concentric circles at M,

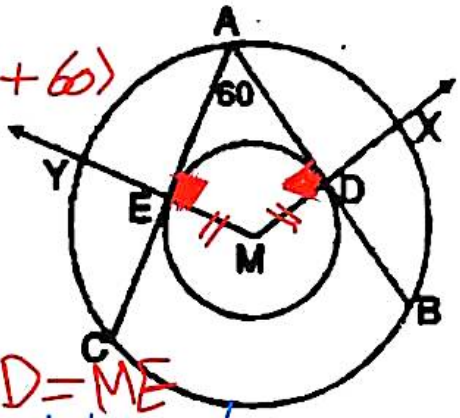
$\overline{AB}$, $\overline{AC}$ are two chords in greater circle

And touch smaller circle at D,E

Draw $\overrightarrow{MD}$, $\overrightarrow{ME}$ cut greater circle

at X,Y, m (∠DAE) = 60° MX = MY = r ; MD = ME

① Find m(∠DME) ② Prove XD = YE by subtracting



B) In the opposite figure: Draw $\overleftrightarrow{AE}$ tangent

$\overline{AB}$ is diameter in circle M, $\overline{YB}$ is tangent

Prove that: ∵ AE // BY

∴ m(∠EAY) = m(∠Y) → (1) (alternate)

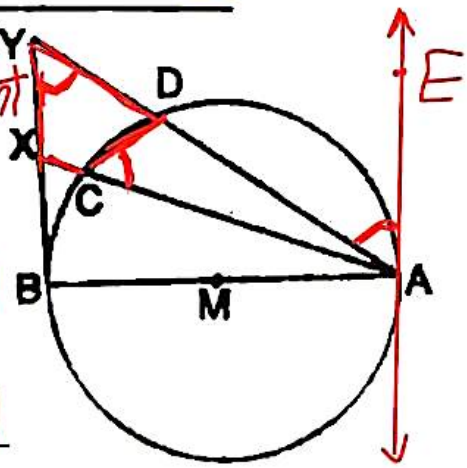
DCXY is cyclic quadrilateral

∵ m(∠EAD) = m(∠ACD) → (2)

(tangency, inscribed) End of the questions

∴ m(∠ACD) = m(∠Y)

exterior — opposite of adjacent



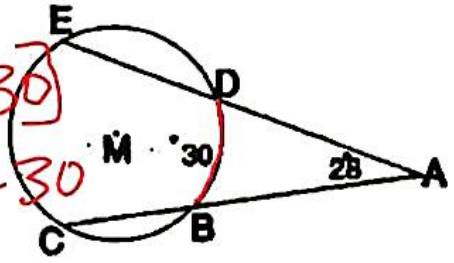
MODEL EXAM NO (10)

[Q1] A) Choose the correct answer:

(1) In the opposite figure: $28 = \frac{1}{2}[\overset{\frown}{EC} - 30]$

$\overrightarrow{ED} \cap \overrightarrow{CB} = \{A\}$, $m(\overset{\frown}{DB}) = 30°$ $56 = \overset{\frown}{EC} - 30$

$M(\angle A) = 28°$, then $m(\overset{\frown}{EC}) = \ldots\ldots°$



a) 56 b) 30 c) 86 d) 28

(2) If AB = 6 cm, then circumference of smallest circle passing through A, B = $2\times\pi\times3$ Cm $\frac{1}{2}AB = 3$ CM

a) 3π b) 6π c) 8π d) 9π

(3) If ABCD is cyclic quadrilateral, $m(\angle A) - m(\angle C) = 60°$, then $m(\angle C)$

a) 60° b) 120° c) 240° d) 360°

Draw $ME \perp \overline{CB}$

[B] In the opposite figure:

$\sin(\angle BME) = \frac{3}{2\sqrt{3}}$

$\therefore m(\angle BME) = 60$

$\therefore m(\angle BMC) = 120$

$\therefore m(\angle A) = 60$

A circle M of radius $2\sqrt{3}$, BC = 6 cm

Find $m(\angle A)$, $m(\angle BDC)$ 60, 120

Ms/Randa Hegazy

[Q2] A) Choose the correct answer:

(1) M, N, L are three touching externally circles two by two, their radii 5, 6, 4 cm then perimeter of Δ MNL = 16+12+8 cm

a) 15 b) 30 c) 40 d) 60

(2) The length of arc opposite to central angle of measure 120° in a circle of radius r is $\frac{L}{2\pi r} = \frac{120}{360}$

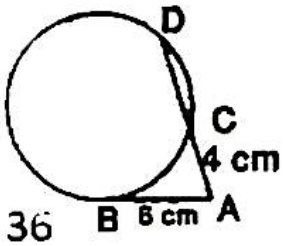
a) $\frac{1}{3}\pi r$ b) πr c) $\frac{2}{3}\pi r$ d) $3\pi r$

(3) **In the opposite figure:**

$\overline{AB}$ is tangent, AB = 6 cm, $(AB)^2 = AC \times AD$

AC = 4 cm Then CD = 9 − 4 cm $6^2 = 4 \times AD$

$AD = 9$CM



a) 5 b) 9 c) 12 d) 36

[B] In the opposite figure: $\overline{AE}$ median of ΔABC

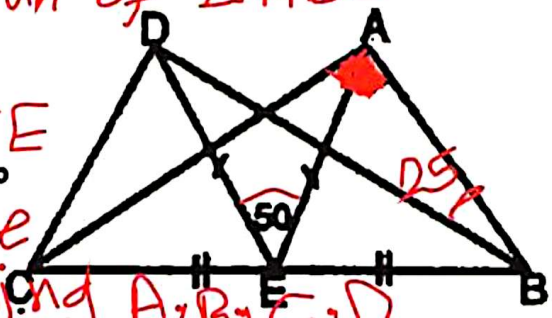
EB = EC , AE = ED $AE = \frac{1}{2} BC$

$\therefore AE = DE = BE = CE$

M(∠AED) = 50°, m (∠BAC) = 90°

$\therefore$ E is the center of the circle passing A, B, C, D

Find m (∠ABD)



$m(\angle ABD) = \frac{1}{2} m(\angle AED) = 25$

inscribed — central

[Q3] Ms/Randa Hegazy

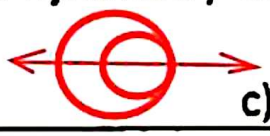
$\sqrt{5^2 - 4^2}$

[A] Choose the correct answer:

(1) A chord of 8 cm in a circle of diameter 10 cm, then its distance from center ..... Cm

a) 1 b) 2 c) 3 d) 4

(2) Number of axes of symmetry of two touching internally circles is.....



a) Zero b) 1 c) 2 d) 3

(3) ABCD is a cyclic quadrilateral, m (∠A) = 2 m (∠C) , then m (∠A)= 2X60°

x + 2x = 180 → 3x = 180

x = 60

a) 35 b) 55 c) 140 d) 120

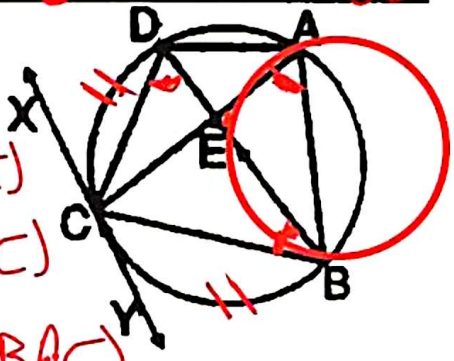
[B] In the opposite figure:

ABCD is quadrilateral is drawn in circle

Its diagonals intersect at E,

Draw $\overleftrightarrow{XY}$ tangent to circle at C where $\overleftrightarrow{XY} \parallel \overline{BD}$

Prove that: $\overline{BC}$ is tangent to circle passing through vertices of Δ ABE



$\therefore \overleftrightarrow{XY} \parallel \overline{BD}$

$\therefore m(\overset{\frown}{CD}) = m(\overset{\frown}{BC})$

$\therefore m(\angle BDC) = m(\angle DBC)$

$\therefore m(\angle BDC) = m(\angle BAC)$

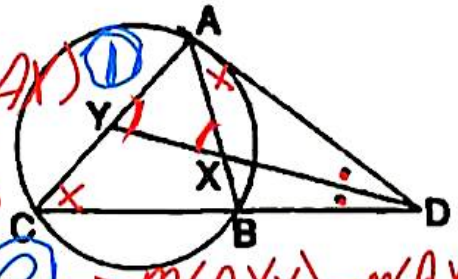
$\therefore m(\angle DBC) = m(\angle BAC)$

[Q4]

[A] In the opposite figure:

$\overrightarrow{DA}$ is tangent at A, $\overline{DY}$ bisects ∠ ADC

Prove that: Δ AXY is isosceles triangle



∠AXY exterior of Δ AXD

$\therefore m(\angle AXY) = m(\angle ADX) + m(\angle DAX)$ (1)

∠AYX exterior of ΔYCD

$\therefore m(\angle AYX) = m(\angle ACB) + m(\angle YDC)$ (2) → $m(\angle AYX) = m(\angle AXY)$

[B] ABCD is quadrilateral, $m(\angle A) = 7X$, $m(\angle B) = 4X - 30°$

$m(\angle C) = 2X$, $m(\angle D) = 5X + 30°$,

↳ **Prove that** ABCD is cyclic quadrilateral.

$7X + 4X - 30 + 2X + 5X + 30 = 360°$ → $18X = 360$

$X = 20$

$\therefore m(\angle A) = 140°$, $m(\angle C) = 40°$

$\therefore m(\angle A) + m(\angle C) = 180$

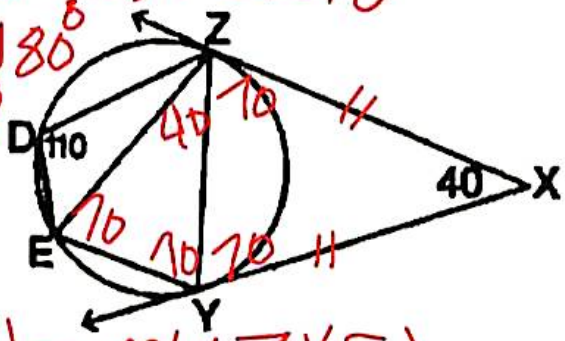
[Q5]

[A] In the opposite figure:

$\overrightarrow{XY}$, $\overrightarrow{XZ}$ are two tangents,

$m(\angle YXZ) = 40°$, $m(\angle ZDE) = 110°$,

Prove that ZE = ZY



$m(\angle ZEY) = m(\angle XZY) = (180 - 40) \div 2 = 70°$

$m(\angle ZDE) + m(\angle ZYE) = 180°$

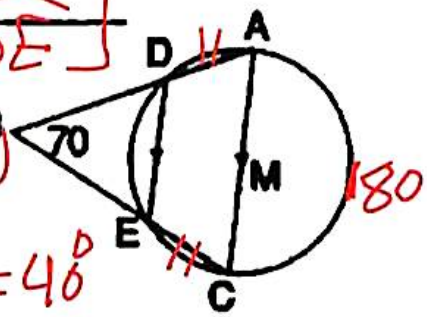
$\therefore m(\angle ZYE) = 70°$

$\therefore m(\angle ZEY) = m(\angle ZYE)$

[B] In the opposite figure:

$\overline{AC}$ is diameter in circle M,

$\overline{DE}$ // $\overline{AC}$, $m(\angle B) = 70°$, Find m ($\overset{\frown}{DA}$)



$m(\angle B) = \frac{1}{2}[\overset{\frown}{AC} - \overset{\frown}{DE}]$

$70 = \frac{1}{2}(180 - \overset{\frown}{DE})$

$\therefore m(\overset{\frown}{DE}) = 40°$

$m(\overset{\frown}{DA}) = m(\overset{\frown}{EC})$ → $\therefore 2m(\overset{\frown}{DA}) + 40 = 180$

$\therefore m(\overset{\frown}{DA}) = 70°$

End of the questions

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MODEL EXAM NO (11)

[Q1] A) Choose the correct answer:

(1) A circle of radius 3 cm and its center is origin point, which of the following points lies on the circle? $x^2 + y^2 = 3^2$

a) $(\sqrt{5}, 0)$ b) $(2, \sqrt{5})$ c) $(1, \sqrt{3})$ d) $(1, 3)$

(2) Number of circles which passing through three collinear points is

a) Zero b) 1 c) 3 d) Infinite

(3) In the opposite figure:
$M(\angle C) = 30°$, $m(\angle B) = 20°$
Then $m(\angle AME) = \ldots\ldots°$

a) 20 b) 50 c) 100 d) 120

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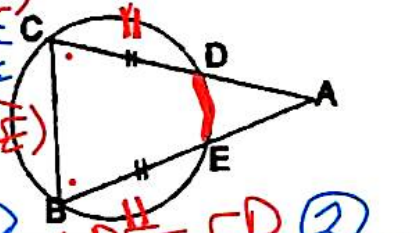
[B] In the opposite figure:
$\overline{EC}$, $\overline{DB}$ are two equal chords
$\overrightarrow{DB} \cap \overrightarrow{CE} = \{A\}$.
Prove that: AD = AE



$m(\overset{\frown}{CD}) = m(\overset{\frown}{BE})$ by adding $\overset{\frown}{DE}$
$\therefore m(\overset{\frown}{CDE}) = m(\overset{\frown}{CBE})$
$\therefore m(\angle B) = m(\angle A)$
$\therefore AB = AC$ (1) , $BE = CD$ (2)

[Q2] [A] Choose the correct answer:

(1) A circle M of diameter (2X+5) cm, straight line L is distant from its center (X+2) cm, X >0, then L is .....circle

a) Outside the b) Tangent to c) Secant to d) Axis of the

$r = x + 2.5$

(2) If AB is diameter in circle M, $\overleftrightarrow{AC}$, $\overleftrightarrow{BD}$ are two tangents, then AC .....BD

a) Intersect b) Parallel c) Perpendicular d) Coincide

(3) In the opposite figure:
A quarter circle of center M,
C is midpoint of $\overline{AB}$, Then $m(\angle A) = \ldots\ldots°$

a) 20 b) 30 c) 45 d) 60

$\angle M = 90°$, MC median
$MC = \frac{1}{2} AB$
$\therefore MB = MC = BC$
$\triangle MBC$ equilateral

[B] In the opposite figure:

AC = DB, AB = (3 X – 5) cm

DC = (x + 3) cm, find length of $\overline{AB}$

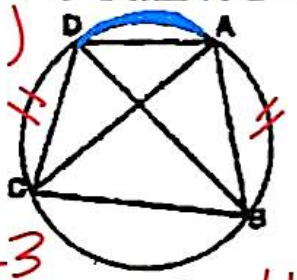
$m(\overset{\frown}{BAD}) = m(\overset{\frown}{CDA})$ by subtracting $\overset{\frown}{AD}$

$\therefore m(\overset{\frown}{AB}) = m(\overset{\frown}{DC})$

$\therefore 3x - 5 = x + 3$

$2x = 8 \rightarrow x = 4$

$\therefore AB = 7\,cm$



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[Q3] [A] Choose the correct answer:

$r = 6\,cm$

(1) If the longest chord in a circle is 12 cm, its circumference =.....

a) 6π b) 12π c) 24π d) 144π

(2) The radius of two circles M , N are 6 cm , 8 cm and MN = 14 cm, then the two circles are

$MN = r_1 + r_2$

a) Intersecting b) Distant

c) One inside other d) Touching externally

(3) The inscribed angel in half circle is .....

a) Acute b) Straight c) Right d) obtuse

[B] In the opposite figure:

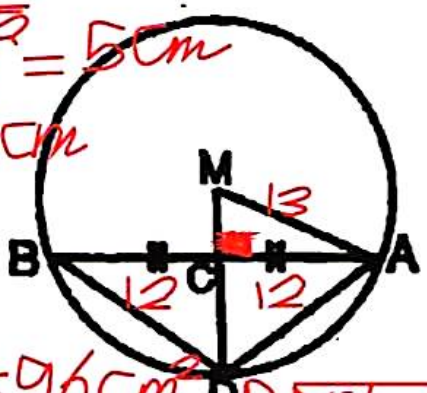
A circle M of radius 13 cm,

$\overline{AB}$ is chord of length 24 cm,

C. midpoint of $\overline{AB}$, $\overrightarrow{MC} \cap$ circle = {D}.

$MC = \sqrt{13^2 - 12^2} = 5\,cm$

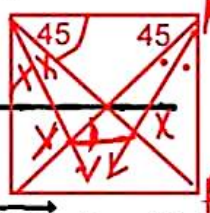
$CD = 13 - 5 = 8\,cm$



Find by proof area of Δ ADB $= \frac{1}{2} \times 24 \times 8 = 96\,cm^2$

[Q4]

$\overline{AC}$ bisect $\angle A$, $\overline{DB}$ bisects $\angle D$



[A] ABCD is a square, $\overrightarrow{AX}$ bisects ∠ BAC and cut $\overrightarrow{BD}$ in X, $\overrightarrow{DY}$ bisects ∠CDB and cut $\overline{AC}$ in Y, prove that: $\frac{1}{2} m(\angle BAC) = \frac{1}{2} m(\angle BDC)$

① AXYD is cyclic quadrilateral

② m (∠ AYX) = 45°

$\therefore m(\angle XAY) = m(\angle XDY)$

$m(\angle AYX) = m(\angle ADX) = 45^\circ \therefore AXYD$ cyclic quad.

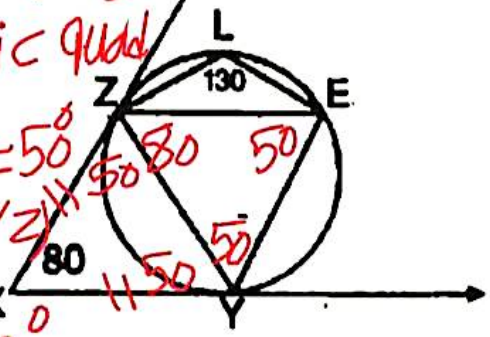
[B] In the opposite figure:

$\overleftrightarrow{XY}$, $\overleftrightarrow{XZ}$ are two tangents to circle at Y, Z

M(∠YXZ) = 80°, m (∠ELZ) = 130°

Prove that: ① ZE = ZY

② $\overline{XZ} \parallel \overline{EY}$



$m(\widehat{XZY}) = m(\widehat{XYZ}) = \frac{180-80}{2} = 50^\circ$

$\therefore m(\angle YEZ) = 50$

$\therefore$ ZLEY cyclic quad.

$\therefore m(\widehat{EYZ}) = 50^\circ$

$\therefore m(\angle YEZ) = m(\widehat{EYZ})$ alt. $= 50$

$m(\angle X) + m(\angle EYX) = 180^\circ$

[Q5] Draw MA , ME → $\widehat{ED} = \widehat{DC} = \widehat{CB} = \widehat{BA} = \widehat{AE}$

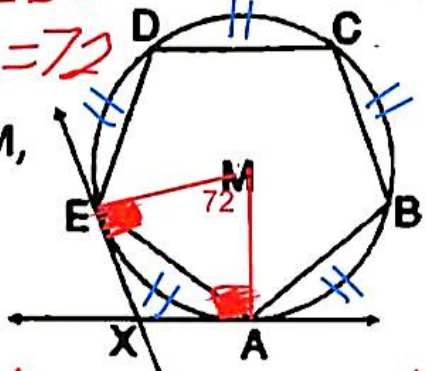
[A] In the opposite figure:

ABCDE is regular pentagon is drawn in circle M,

$\overleftrightarrow{AX}$ is tangent at A, $\overleftrightarrow{EX}$ is tangent at E

Where $\overleftrightarrow{AX} \cap \overleftrightarrow{EX} = \{X\}$,

Find m ($\widehat{EA}$) , m (∠ AXE)



$= 360 \div 5 = 72$

72°

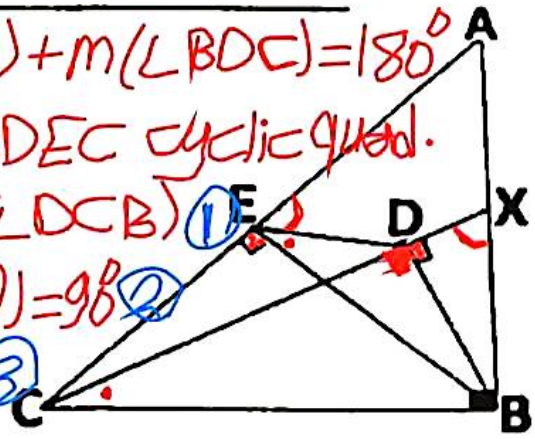
$360^\circ - (90^\circ + 90^\circ + 72^\circ) = 108^\circ$

[B] In the opposite figure:

Δ ABC is right at B, $\overline{BE} \perp \overline{AC}$, $\overline{BD} \perp \overline{XC}$

Prove that:

AXDE is cyclic quadrilateral□



$m(\angle BEC) + m(\angle BDC) = 180^\circ$

BDEC cyclic quad.

$\therefore m(\angle DEB) = m(\angle DCB)$ (1)

$m(\angle DEB) + m(\angle DEA) = 90^\circ$ (2)

$m(\angle DCB) + m(\angle BXC) = 90^\circ$ (3)

$\therefore m(\angle BXC) = m(\angle DEA)$

$\therefore$ AXDE cyclic quad.

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End of the questions

MODEL EXAM NO (12)

[Q1]

[A] Choose the correct answer:

(1) The ratio between the measure of inscribed angle and the central angle are subtended by same arc equals .....

a) 1 : 2 b) 2 : 1 c) 1 : 1 d) 1 : 3

(2) If M, N are two circles are touching externally their radii 2 cm , 4 cm respectively, then the circumference of circle whose diameter $\overline{MN}$ equals ..... cm $MN = r_1 + r_2 = 6$ cm

a) 4π b) 6π c) 8π d) 12π

(3) ABCD is cyclic quadrilateral, m ($\angle$ A) = 2 m ($\angle$ B) = 5 m ($\angle$C), then the m ($\angle$ D) = ... $\angle B = 150 \div 2 = 75$ $\angle C = x$ $x + 5x = 180 \rightarrow 6x = 180$ $x = 30$ $\angle A = 5 \times 30 = 150$ $180 - 75$

a) 30 b) 75 c) 105 d) 150

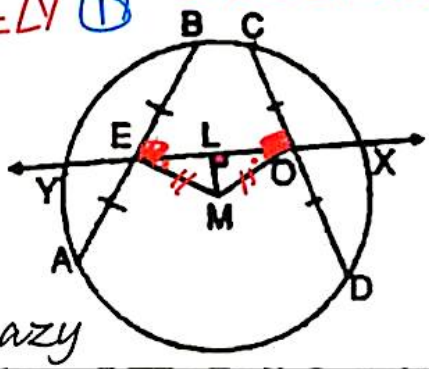
[B] In the opposite figure:

$\overline{AB}$, $\overline{CD}$, are two equal chords in the circle M, O is midpoint of $\overline{CD}$, E is midpoint of $\overline{AB}$, $\overline{ML} \perp \overline{XY}$, Prove that: OX = EY

$\overline{ML} \perp \overline{XY} \rightarrow \angle X = \angle Y$ (1)

$AB = CD \rightarrow MO = ME \rightarrow \Delta MLO = \Delta MLE$ by subtracting

$\therefore LO = LE$ (2)



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[Q2]

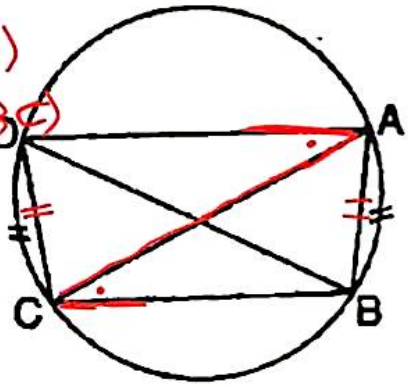
[A] In the opposite figure:

m ($\overset{\frown}{AB}$) = m ($\overset{\frown}{CD}$)

Prove that: $\overline{AD} \parallel \overline{BC}$

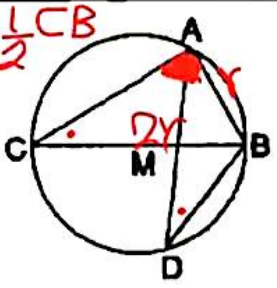
$\because m(\overset{\frown}{AB}) = m(\overset{\frown}{CD})$

$\therefore m(\angle DAC) = m(\angle DBC)$ (alternate)



[B] Choose the correct answer:

$\angle BAC = 90^\circ$, $AB = \frac{1}{2} CB$
$\therefore m(\angle ACB) = 30^\circ$
$\therefore m(\angle ADB) = 30^\circ$



(1) If $\overline{BC}$ is diameter in circle M, And its radius r, if AB = r, then m (∠ D) = ...°

a) 30 b) 45 c) 50 d) 60

r = 4 cm

(2) A circle M of diameter 8 cm, if line L is outside the circle, then the distant between the center M and line L ∈ .....

a)] 4 , ∞ [b) [0 , 4 [c)] 0 , 4 [d) [0 , 4]

(3) In the opposite figure:
Two concentric circles M,
m ($\widehat{EA}$) = 80°
Then m ($\widehat{CB}$) = ...°

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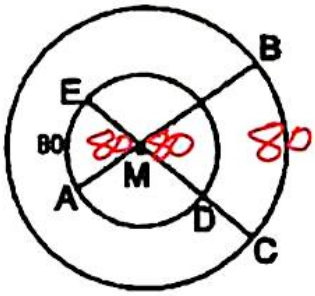
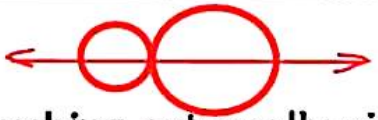


a) 40 b) 60 c) 80 d) 160

[Q3] [A] Choose the correct answer:



(1) Number of axes of symmetry of two touching externally circles equals .....

a) 4 b) 2 c) 1 d) Infinite

(2) The circumference of circle in which passing through the vertices of a square whose side 6 cm equals .....

$\sqrt{6^2+6^2} = 6\sqrt{2}$

a) $6\sqrt{2}\,\pi$ b) 6π c) $12\sqrt{2}\,\pi$ d) 12π

(3) The length of the arc is opposite to a central angle of 90° in a circle of radius r is ..... cm

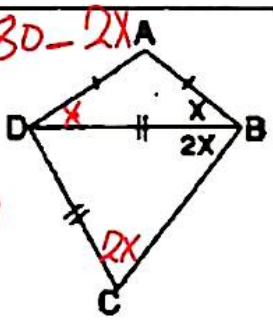
$\frac{\text{arc}}{2\pi r} = \frac{90}{360} = \frac{1}{4}$

a) $2\pi r$ b) πr c) $\frac{1}{2}\pi r$ d) $4\pi r$

[B] In the opposite figure:

AB = AD, DB = CD
M (∠ ABD) = X°, m (∠ CBD) = (2 X)°
Prove that: ABCD is cyclic quadrilateral

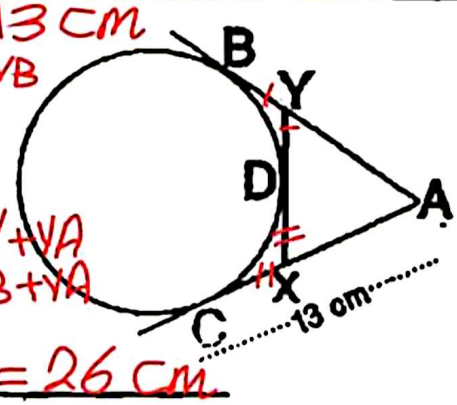
$\angle A = 180^\circ - (X + X) = 180 - 2X$
$\angle C = 2X$
$m(\angle A) + m(\angle C) = 180^\circ - 2X + 2X = 180^\circ$



[4] [A] In the opposite figure:

$\overline{AB}$, $\overline{AC}$ are two tangent to the circle
At B,C respectively, $\overline{XY}$ are tangent
to the circle at D, AC = 13 cm
Find the perimeter of Δ AXY

$AB = AC = 13$ cm
$XD = XC$, $YD = YB$

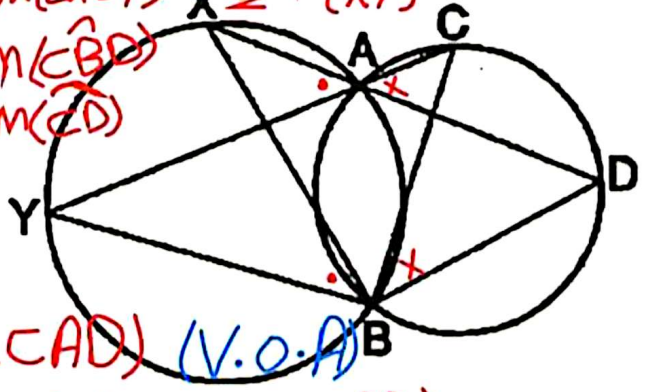


$P = AX + XD + DY + YA$
$= AX + XC + YB + YA$
$= AC + AB$
$= 13 + 13 = 26$ cm.

[B] In the opposite figure:

Two intersecting circles
$\overline{AC}$ cut the smaller circle at C
And cut greater circle at Y
$\overline{AD}$ cut the smaller circle at D
And cut greater circle at X
Prove that:
m (∠ CBD) = m (∠ XBY)

$m(\angle XAY) = m(\angle XBY) = \frac{1}{2} m(\overset{\frown}{XY})$
$m(\angle CAD) = m(\angle CBD)$
$= \frac{1}{2} m(\overset{\frown}{CD})$



$\because m(\angle XAY) = m(\angle CAD)$ (V.O.A)
$\therefore m(\angle XBY) = m(\angle CBD)$

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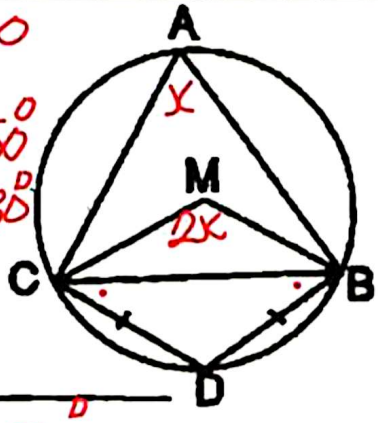
[5] [A] In the opposite figure:

$m(\angle BMC) = 2\, m(\angle A)$
M (∠ BMC) − m (∠ A) = 50°,
BD = CD,
Find m (∠ A) , m (∠ DBC)

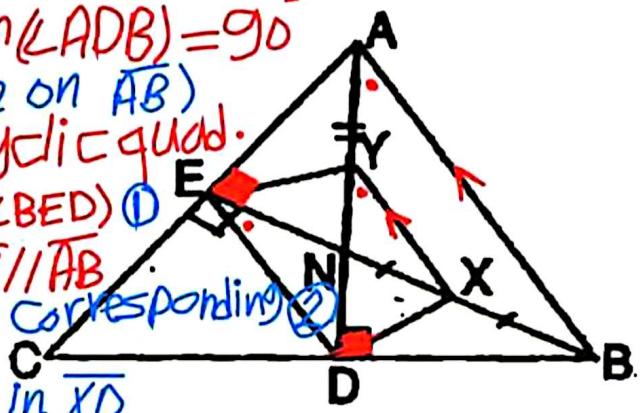
$2x - x = 50$
$\therefore x = 50$, $\therefore m(\angle A) = 50^\circ$
$\therefore m(\angle BDC) = 130^\circ$
$\therefore m(\angle DBC) = \frac{180 - 130}{2}$
$= 25^\circ$



[B] In the opposite figure:

Δ ABC, $\overline{AD} \perp \overline{BC}$, $\overline{BE} \perp \overline{AC}$ (drawn on $\overline{AB}$)
X is midpoint of $\overline{BN}$.
Y is midpoint of $\overline{AN}$,
Prove that:
XYED is cyclic quadrilateral

$m(\angle AEB) = m(\angle ADB) = 90^\circ$
$\therefore$ ABDE cyclic quad.
$\therefore m(\angle BAD) = m(\angle BED)$ ①
$\because XN = XB$, $YA = YN \rightarrow \overline{XY} // \overline{AB}$
$\therefore m(\angle XYN) = m(\angle BAD)$ corresponding ②
$\therefore m(\angle XED) = m(\angle XYD)$ drawn in $\overline{XD}$
$\therefore$ XYED cyclic quad



End of the questions

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