

بنك أسئلة

الصف
الأول
الإعدادي
٢٠٢٥

التميز

أ / محمود سعيد

ELMotamyez Questions Bank

MATH

Final Revision

BY

MR . Mahmoud ELkhoully



نسخة
مجانية

ملحق الإجابات
بالداخل



El.Motamyez.School

يمكنكم الحصول على المذكرات والاختبارات من خلال مسح رمز ال QR Code
أو من خلال صفحة "التميز - أ / محمود سعيد".
يرجى مراعاة حقوق صاحب المحتوى عند النشر.

Second Term Questions Bank

Question 01

Choose the correct answer

- 1 The probability of a certain event is
 - a 100%
 - b 0
 - c $\frac{2}{5}$
 - d $\frac{1}{2}$
- 2 Which of the following is the image of the point (5,0) by rotation $R(0,90^\circ)$?
 - a (5,0)
 - b (-5,0)
 - c (0,5)
 - d (0,-5)
- 3 A card carrying a letter from the word (School) was drawn randomly. What is the probability that this letter is (S)?
 - a $\frac{1}{6}$
 - b $\frac{1}{3}$
 - c $\frac{2}{3}$
 - d $\frac{1}{5}$
- 4 The image of the point (6,0) by reflection in Y- axis is...
 - a (6,0)
 - b (-6, 0)
 - c (0, 6)
 - d (0, -6)
- 5 $(x^3 + x^2) \div x^2 = \dots\dots\dots$
 - a 0
 - b x
 - c x + 1
 - d $2x + 1$
- 6 $\sqrt[3]{a^{15}} = \sqrt{\dots}$
 - a a^5
 - b a^{10}
 - c a^{12}
 - d a^{18}
- 7 A trapezium with a middle base length of 6 cm and height 7 cm, then its area = ...cm²
 - a 13
 - b 42
 - c 30
 - d 26
- 8 If the side length of a rhombus is 5 cm and its height is 4 cm, then its area =cm²
 - a 9
 - b 18
 - c 20
 - d 40
- 9 Which of the following could be a probability of an event occurring?
 - a 1.3
 - b -0.5
 - c 150%
 - d $\frac{2}{3}$
- 10 What is image of the point (5, -4) by rotation $R(0,180^\circ)$ followed by rotation $R(0,-90^\circ)$
 - a (-5, -4)
 - b (-4, -5)
 - c (-5, 4)
 - d (4, 5)
- 11 The probability of the impossible event =
 - a \emptyset
 - b 0
 - c $\frac{4}{5}$
 - d $\frac{1}{2}$



- 12 If the probability of an event occurring is $\frac{1}{5}$, the probability of it not occurring is .
 (a) $\frac{1}{5}$ (b) $\frac{1}{4}$ (c) $\frac{4}{5}$ (d) $\frac{1}{3}$
- 13 Identity rotation is a rotation around the origin 0 by an angle of measure
 (a) 90° (b) 180° (c) 270° (d) 360°
- 14 $\frac{5x^2y - \dots}{5xy} = x - 3y$
 (a) $\frac{3}{5}xy$ (b) $\frac{3}{5}yx^2$ (c) $15x^2y$ (d) $15xy^2$
- 15 If the A (3,5) is the image of the point A by translation $(x,y) \rightarrow (x-1,y+2)$, then the point A is
 (a) (2,7) (b) (4,3) (c) (5,3) (d) (4,-3)
- 16 Which of the following points remains the same when reflected in the y-axis?
 (a) (-7, 0) (b) (0, 3) (c) (-2, 5) (d) (4, -10)
- 17 What is the image of the point (a,b) by reflection in the y-axis ?
 (a) (a,-b) (b) (-a,b) (c) (b,-a) (d) (-b,a)
- 18 What is the image of the point (2,-3) by translation 3 units upwards?
 (a) (5,-3) (b) (5,-6) (c) (2,0) (d) (5,0)
- 19 A trapezium with a height of 5.4 cm and the lengths of its parallel bases are 8 cm and 10 cm , has an area of Square centimeters.
 (a) 48.6 (b) 54 (c) 97.2 (d) 432
- 20 The product of the length of two diagonals of a square is 16 square meters. What is its area in square meters?
 (a) 4 (b) 8 (c) 32 (d) 128
- 21 What is the image of the point (a , b) by translation $(x , y) \rightarrow (x+2 , y-3)$?
 (a) (a-3 , b+2) (b) (a+2 , b-3) (c) (2 , -3) (d) (a+2 , b+3)
- 22 The image of the point is the same point by reflection in the X-axis.
 (a) (-3,0) (b) (0,2) (c) (-4,10) (d) (-2,-5)
- 23 In an experiment of tossing a fair coin once and observing the upper face, what is the probability of obtaining a head (H)?
 (a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) Zero
- 24 $\frac{1}{4}$ of the number 4^8 is
 (a) 4^2 (b) 4^4 (c) 4^6 (d) 4^7



- 25** A trapezium with a middle base length of X cm and a height is equal to half the length of its middle base. What is its area in square centimeters?
 (a) x^2 (b) $\frac{x^2}{2}$ (c) $\frac{x^2}{4}$ (d) $\frac{x^2}{8}$
- 26** If the probability of a student success is 85 %, then the probability of failure is
 (a) 50% (b) 15% (c) $\frac{1}{4}$ (d) $\frac{1}{2}$
- 27** $|\sqrt[3]{-64}| = \dots\dots\dots$
 (a) 8 (b) 4 (c) 2 (d) -4
- 28** If $x-4 > 1$, then which of the following could be the value of x ?
 (a) 0 (b) -4 (c) 5 (d) 6
- 29** The sum of the probabilities of all possible outcomes of any random experiment =....
 (a) 50% (b) 1 (c) 0 (d) $\frac{1}{2}$
- 30** In the experiment of forming a 2- different digit number from The set of numbers {1, 2, 3} , the number of elements in the sample space is
 (a) 3 (b) 6 (c) 4 (d) 9
- 31** The length of the middle base in a trapezium is equal to 15 feet and its height is 8 feet. What is it area?
 (a) 30 square feet (b) 120 square feet
 (c) 240 square feet (d) 23 square feet
- 32** In an experiment of tossing a fair coin three consecutive times and observing the upper face, how many elements are there in the sample space?
 (a) 2 (b) 4 (c) 8 (d) 16
- 33** In an experiment of rolling a fair die once, what is Probability of appearing a number less than 5?
 (a) $\frac{1}{6}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$
- 34** Which of the following numbers is in scientific notation?
 (a) 11×10^{11} (b) 75×10^{16} (c) -1.2×10^{-3} (d) 0.05×10^{11}
- 35** The probability of a certain event is
 (a) $\frac{3}{4}$ (b) 100% (c) 0 (d) $\frac{1}{2}$



- 36 If a rhombus with diagonal lengths of 6 inches and 10 inches, then what is its area?
 (a) 30 square inches (b) 60 square inches
 (c) 16 square inches (d) 120 square inches
- 37 The rotation $R(0, 180)$ followed by the rotation $R(0, 180)$ is equivalent to the rotation
 (a) $R(0, 180)$ (b) $R(0, 360)$ (c) $R(0, 90)$ (d) $R(0, -90)$
- 38 In an experiment of rolling a fair die once, what is the probability of appearing a prime even number?
 (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{1}{4}$
- 39 If the area of a rhombus is 18 cm^2 , then the product of its diagonal lengths is cm^2
 (a) 9 (b) 36 (c) 6 (d) 54
- 40 In an experiment of selecting one of the digits randomly from the number 6,543, what is sample space?
 (a) {6, 543} (b) {65, 43} (c) {6, 5, 4, 3} (d) {65, 43, 54}
- In the opposite figure :
- 41 When bisecting $\angle BAC$ with a compass makes you find that:
 $m \angle BAF = \dots\dots$
 (a) $m \angle BFA$ (b) $m \angle EAF$ (c) $m \angle EFA$ (d) $m \angle BAC$
-
- 42 What is the image of the point (5, -3) by reflection in the X-axis followed by reflection in the Y-axis?
 (a) (-5, 3) (b) (5, 3) (c) (-5, -3) (d) (-3, -5)
- 43 A trapezium with an area 100 cm^2 and a middle base length 8cm, then its height = cm
 (a) 8 (b) 10 (c) 12 (d) 12.5
- 44 Selecting a ball from a basket containing 6 identical balls, all are blue is
 (a) not a random experiment (b) a simple event
 (c) a random experiment (d) an impossible event
- 47 What rotation makes the image of the point A (2, -5) become the point $A'(-5, -2)$?
 (a) $R(0, 90^\circ)$ (b) $R(0, -90^\circ)$ (c) $R(0, 180^\circ)$ (d) $R(0, 360^\circ)$
- 48 If the area of a square is 50 cm^2 , then the length of its diagonal = Cm
 (a) 10 (b) 100 (c) 25 (d) 15



- 49 In an experiment to form a 2-digit number formed from different digits from the set {2,6,3}, how many elements are there in the event that expresses "the resulting number is even" ?
 (a) 2 (b) 3 (c) 4 (d) 6
- 50 What is the image of the point (3,-9) by rotation $R(0,180^\circ)$ followed by rotation $R(0,-90^\circ)$?
 (a) (-3,-9) (b) (-9,-3) (c) (-3,9) (d) (9,3)
- 51 What is the coefficient of a b in the expansion of the expression $(4a - 5b)^2$?
 (a) -40 (b) 50 (c) 20 (d) 40
- 52 Which of the following cannot be a probability of an event?
 (a) 0.3 (b) -0.3 (c) 31% (d) $\frac{1}{2}$
- 53 Which the following equals $a^{-1} \times a^3$?
 (a) a^2 (b) a^4 (c) $\frac{1}{a^2}$ (d) $\frac{1}{a^3}$
- 54 If the image of the point A (x, y) under rotation $R(0,90)$ is $A'(-2, -5)$ then $x+y=...$
 (a) -3 (b) -7 (c) 3 (d) 7
- 55 A box contains 28 apples, of which 8 are bad. If an apple is drawn randomly from the box, the probability that this apple is not bad is ...
 (a) $\frac{1}{7}$ (b) $\frac{5}{7}$ (c) 1 (d) $\frac{2}{5}$
- 56 A trapezium with parallel base of length 6cm and 10 cm and a height of 6 cm, then its area = ... cm^2
 (a) 16 (b) 48 (c) 360 (d) 180
- 57 If $x \in N$, what is the solution set to the inequality $-x > 3$?
 (a) {-4,-5,...} (b) {4,5,6,...} (c) {-3} (d) \emptyset
- 58 What is the image of the point (2, -3) by rotation around the origin with angle of measure 90° anticlockwise
 (a) (-2, -3) (b) (3, 2) (c) (-2, 3) (d) (2, -3)
- 59 A ball is drawn from a box containing a set of identical balls numbered from 1 to 15, and the number drawn is recorded this is
 (a) a random experiment. (b) not a random experiment
 (c) an impossible event. (d) a certain event.





- 60 A rhombus with a side length of 15 cm and diagonal lengths of 18 cm and 24 cm. What is its height?
 (a) 28.8 cm (b) 7.2 cm (c) 14.4 cm (d) 360 cm
- 61 A card carrying a letter from the word "NORHAN" is drawn randomly. What is the probability that this letter is "N"?
 (a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{2}{5}$ (d) $\frac{2}{3}$
- 62 1.82×10^{-5} 2.1×10^{-5}
 (a) < (b) > (c) = (d) other
- 63 If B is an event from a random experiment and $P(B)$ equals $\frac{3}{4}$, then $P(\text{not } B)$ equals ..
 (a) $\frac{1}{4}$ (b) $\frac{2}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$
- 64 If $(x+2)(x-5) = x^2 + bx + c$, then $c = \dots$
 (a) 10 (b) -10 (c) 7 (d) -7
- 65 What is the point whose image by rotation $R(0, 180^\circ)$ is $(-3, 1)$?
 (a) $(3, 1)$ (b) $(1, 3)$ (c) $(-1, 3)$ (d) $(3, -1)$
- 66 What is the area of a square with side length of 6 feet?
 (a) 6 (b) 12 (c) 36 (d) 18
- 67 If the sample space for a random experiment is $S = \{3, 6, 7, 9\}$, then the event of showing a prime number is
 (a) $\{3, 7, 9\}$ (b) $\{3, 6, 7\}$ (c) $\{3, 7\}$ (d) $\{3, 6, 7, 9\}$
- 68 If a rhombus with diagonal lengths of 5 cm and 10 cm, then what is its area?
 (a) 50 cm^2 (b) 25 cm^2 (c) 100 cm^2 (d) 15 cm^2
- 69 $\sqrt{36} + \sqrt{16} = \sqrt{\dots \dots \dots}$
 (a) 100 (b) 120 (c) 52 (d) 10
- 70 If $x+y=4$, and $x^2 - y^2 = 36$, then what is the value of $x - y$?
 (a) 9 (b) 144 (c) 32 (d) 40
- 71 Which of the following equals $3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$?
 (a) 3×7 (b) 7^3 (c) 3^7 (d) $3 + 7$
- 72 Which inequality expresses that two times the number x is greater than or equal to 5?
 (a) $2x \geq 5$ (b) $2x > 5$ (c) $x \geq 5$ (d) $5x \geq 2$



- 73 Which of the following is the largest?
 a 5.6×10^{-4} b 7.8×10^{-8} c 3.6×10^{-3} d 5.8×10^{-6}
- 74 If the probability of success of a student is 70%. Then the probability of his failure is
 a 0.03 b 0.3 c 0.07 d 0.7
- 75 What is the multiplicative inverse of the number $\sqrt{\frac{9}{25}}$ in the simplest form ?
 a $-\frac{3}{5}$ b $-\frac{5}{3}$ c $\frac{3}{5}$ d $\frac{5}{3}$

Question 02

Answer the following questions

- 1 In an experiment of tossing a fair coin twice consecutively and observing the sequence of heads and tails, write the sample space (S) and then express each of the following events:
 1) A is the event "a tail appears on the first toss".
 2) B is the event "a head appears on only one of the tosses".
 3) C is the event "the same result appears on both tosses".

- 2 Find the diagonal length of the square whose area is equal to the area of a rhombus with diagonal lengths of 4 meters and 25 meters.

- 3 Find the quotient of : $\frac{18x^3 + 12x^2 - 6x}{-6x}$

- 4 Calculate the area of a rectangle his length exceeds 3 units than his width, and his width equal x length Units.

- 5 Simplify to the simplest form : $\frac{x^{-3} \times x^5 \times (-x)^4}{x^2 \times x^{-4} \times x^6}$,
 then find the numerical value when $x = 2$?



6 If a card is drawn randomly from identical cards numbered from 20 to 29. Find the probability that the card carries.

- a) An even number b) A number less than 22

.....

7 If a fair coin was tossed 150 times and heads appeared 48 times, find the experimental probability of appearing:

- 1) Heads (H) 2) Tails (T)

.....

8 Find in the simplest form the value of:

$$\star \frac{2^{-5} \times 2^8}{2^7 \times 2^{-3}}$$

$$\star \frac{a \times a^{-3} \times a^8}{a^5 \times a^{-4}}$$

.....

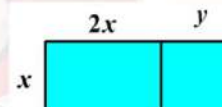
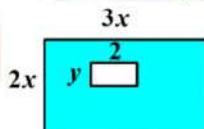
9 Find the area of the trapezium whose lengths of the two parallel bases are 7 cm and 15 cm and its height is 8 cm.

.....

10 Find the product of the following algebraic Expressions: $(x-1)(x^2 - 4x + 6)$, then find the numerical value at $x = -2$

.....

11 Find the area of the shaded part in each of the following shapes in the simplest form:



.....

12 In an experiment of forming a 2-digit number from the set of digits {3, 4, 5}, what is the probability of each of the following events:

- a) A the event that the tens is odd?
 b) B the event that the sum of the two digits is 8 ?
 c) C the event that the product of the two digits equals 20?

.....



13 Find in the simplest form :

$$\left(\frac{5^3 \times 5^{-2}}{5^4 \times 5^{-1}}\right)^{-2}$$

.....

14 Find in simplest form the product $(x - 3)(2x^2 - x + 4)$ and then find the numerical value of the result when $x = -1$

.....

15 A cube has a lateral surface area of 324 square. Find the perimeter of its base lateral area

.....

16 If card is drawn at random from identical cards numbered from 5 to 15, find the probability that the card carries a number:

- 1) prime 2) even 3) greater than 12

.....

17 Find the value of b that makes the expression $(4x^2 + 19x + b)$ by $(4x - 1)$

.....

18 Simplify : $\left(\frac{3}{2}\right)^2 + \sqrt{\frac{25}{4}} + \sqrt[3]{\frac{125}{64}}$.

.....

19 Find the solution set for each of the following in \mathbb{Q}

- 1) $x^3 + 26 = -1$ 2) $2(x+3) \leq 3(x-4)$

.....

20 Find the length of the diagonal of the square whose area equal to the area of a rhombus with diagonal lengths of 4 meters and 16 meters.

.....



21 Draw an angle of measure 60° , then bisect it using A ruler and compass.

.....

Express each of the following situations with an appropriate inequality :

- 22 a) The maximum speed of your car is 80 Km \ h
 b) If 2 is subtracted from three times a number, the result is greater than 7.

.....

23 A box contains one red ball, five blue balls, four White balls, all of which are identical. If a ball is drawn Randomly from the bag and its colour is observed, what is the probability that the drawn ball is:

- 1)Red? 2) Green? 3)Blue or White?

.....

24 Draw ΔABC where $AB = 6 \text{ cm}$, $BC = 5 \text{ cm}$ and $m(\angle B) = 70^\circ$, then determine the type of triangle according to the measures of its angles.

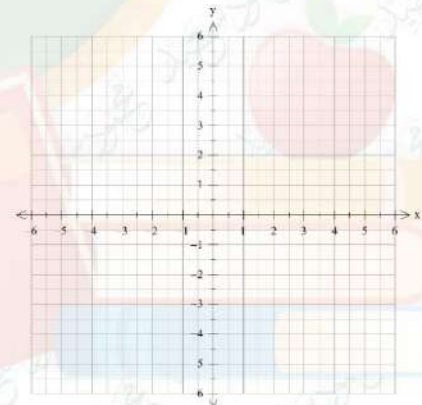
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25 Find the solution set of the inequality $2(3x - 1) \geq 4x - 3$ in Q

.....

26 Draw the triangle ABC where: $A(2, 0)$, $B(4, 1)$, $C(1, 3)$, then draw its image under reflection in the x-axis

.....



27 In the experiment of throwing a regular die once and observing the number that appears on its upper face. Write the sample space, then write each of the following events

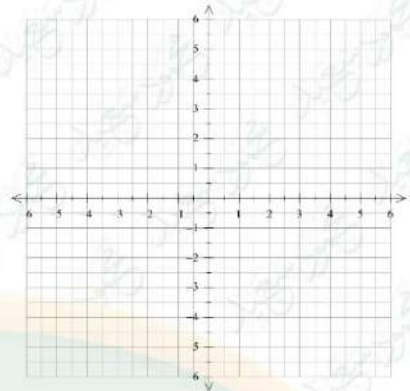
- 1)A is the event of getting a number divisible by 2?
 2)B is the event of getting an odd number that is not prim
 3)C is the event of getting a number greater than or Equal to 4
 4)D is the event of getting a number less than 6

.....



- 28 Draw the rectangle ABCD where A (2, 1), B (2, 3), C (-3, 3), and D (-3, 1), then draw its image by reflection in the X-axis.

.....



- 29 Which has a greater area?
 A rhombus with diagonals lengths of 6 cm and 10 cm or square with a diagonal length 8 cm.

.....

- 30 Draw the triangle ABC where AB = 5cm, $m(\angle A) = 120^\circ$, $m(\angle B) = 30^\circ$ and determine by measuring the type of the triangle according to the length of its sides

.....

- 31 Simplify to the simplest form : $\sqrt{\frac{4}{25}} + \left(\frac{-3}{2}\right)^0 + \sqrt[3]{\frac{27}{125}}$

.....

- 32 Write the sample space of the random experiment of drawing a card from a set of identical cards numbered from 20 to 25 and observing the number written on the drawn card

.....

- 33 If $x = -2$ and $y = 3$, Find the numerical value of each of the following:

1) $x^y = \dots$ 2) $(-y)^3 = \dots$ 3) $(x + y)^2 = \dots$

.....

- 34 Draw an equilateral triangle with a perimeter of 12 cm.

.....



35 Find the quotient of: $\frac{9ab^2 + 18a^2b - 6a^2b^2}{3ab}$

.....

36 Find the solution set in \mathbb{Q} for the inequality:
 $3(x + 2) \geq 5x + 2$

.....

- 37 If a card is drawn randomly from identical cards numbered from 5 to 18, find the probability that the drawn card carries :
- 1) An odd number.
 - 2) An even number greater than 10.
 - 3) A perfect square.
 - 4) A number less than 5.

.....

38 write the result in scientific notation: $(8 \times 10^4) \div (3.2 \times 10^{-3})$

.....

- 39 In your personal library, you have 20 scientific books, 15 literary books, and 5 historical books. If you choose a book at random, what is the probability of selecting a scientific book?

.....

40 write the result in scientific notation: $(2.1 \times 10^4) + (4.1 \times 10^5)$

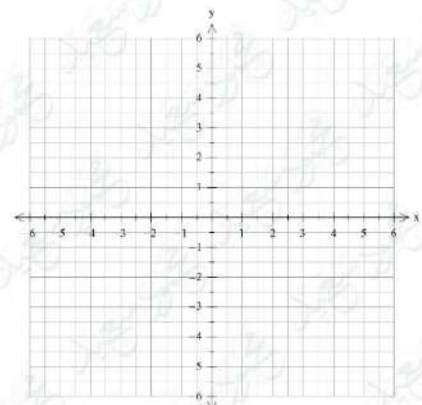
.....

- 41 Draw triangle ΔABC , $A(2,2)$, $B(2,6)$, $C(6,2)$
 by translation $(x, y) \rightarrow (x + 0, y - 5)$?

.....

.....

.....



42 Write the result of the following in scientific notation:

$$(5.2 \times 10^9) - (8.5 \times 10^8)$$

.....

43 Draw a line segment \overline{AB} of length 8 cm , then bisect it using a ruler and compass.

.....

44 Arrange the following numbers in an ascending order :

$$5\ 400\ 000 , 7.1 \times 10^6 , 1.2 \times 10^7 , 0.95 \times 10^7$$

.....

47 In an experiment of rolling a fair die once and observing the number that appears on the upper face, write the sample space and then determine each of the following events, indicating which is simple, certain, or impossible :

- 1) Event (A) is the event of appearing a number divisible by 5
- 2) Event (B) is the event of appearing a number that satisfies the inequality $X > 6$
- 3) Event (C) is the event of appearing an odd number that is not prime.
- 4) Event (D) is the event of appearing a number less than 10
- 5) Event (E) is the event of appearing a perfect cube.

.....

48 The area of rectangle $35x^6 - 15x^5 + 40x^2$ square units , one of its dimension is $5x^2$ unit lenth . find the other dimension .

.....

49 The area of a square equals the area of a triangle with a base length of 9 cm and a height corresponding to this base of 8 cm. Find the length of the square's side.

.....

50 Write the number 128 by using prime factors and exponents.

.....



- 51 Arrange each of the following in an ascending Order:
 $4200\ 000, 3.4 \times 10^6, 0.37 \times 10^7$

- 52 Simplify to its simplest form: $\sqrt[3]{0.064} \times \sqrt{\frac{25}{9}} \times \left(\frac{2}{5}\right)^0$

- 53 A trapezium has an area of 315 square centimeters and a height of 15 cm , If the ratio between the lengths of its two bases is 3 : 4 . What is the length of each base ?

- 54 Solve equation in Z : $2x(x - 5) + 10x = 50$

- 55 A bag contains 40 identical marbles. mostafa draws randomly a marble if the marble is red, and the probability of drawing a red marble is $\frac{3}{8}$, then find the number of red marbles in the bag.

- 56 Write the number 200 by using prime factors and exponents.

- 57 If $a = \frac{2}{3}$, and $b = -\frac{4}{3}$, then find the value of : $|b^3 \div a^3|$

- 58 Find the value of x in $x^2 - 5 = 5x^2 + 13$?

- 59 A box contains 12 red balls, 3 blue balls, and 5 black balls, all of which are identical. If one ball is drawn randomly, calculate the probability that the drawn ball is :
 1) Black. 2) Not red. 3) Blue or red. 4) Green.



69 Find the image of the polygon ABCD by rotation $R(0, -270^\circ)$ where A (2,0) , B (2,4) , C (0,4) , D (0,2).

.....

70 In an experiment to form a 2-digit number from the set of digits {1,7,2}, what is the probability of each of the following events:

- 1) A is the event that the sum of the two digits is 8 ?
 - 2) B is the event that the tens digit is even?
 - 3) C is the event that the tens digit = the once digit ?
-

71 Find the solution set for each of the following equations in Q :

a) $x(x - 3) + 3(x - 27) = 0$ b) $3x^3 - 4 = 2x^3 + 4$

.....

72 Find the solution set for each of the following in Q :

1) $3x^3 + 3 = 84$ 2) $5x^2 - 2 = 43$

.....

انتهت الأسئلة مع أطيب الامنيات بالنجاح والتوفيق



بنك أسئلة

الصف
الأول
الإعدادي
٢٠٢٥

التميز

أ/ محمود سعيد

Model Answers

MATH

Final Revision

BY

MR . Mahmoud ELKhouly



1



El.Motamyez.School

يمكنكم الحصول على المذكرات والاختبارات من خلال مسح رمز ال QR Code
أو من خلال صفحة "التميز - أ/ محمود سعيد".
يرجى مراعاة حقوق صاحب المحتوى عند النشر.

Second Term Questions Bank

Question 01

Choose the correct answer

- 1 The probability of a certain event is
 - a 100%
 - b 0
 - c $\frac{2}{5}$
 - d $\frac{1}{2}$
- 2 Which of the following is the image of the point (5,0) by rotation $R(0,90^\circ)$?
 - a (5,0)
 - b (-5,0)
 - c (0,5)
 - d (0,-5)
- 3 A card carrying a letter from the word (School) was drawn randomly. What is the probability that this letter is (S)?
 - a $\frac{1}{6}$
 - b $\frac{1}{3}$
 - c $\frac{2}{3}$
 - d $\frac{1}{5}$
- 4 The image of the point (6,0) by reflection in Y- axis is...
 - a (6,0)
 - b (-6,0)
 - c (0,6)
 - d (0,-6)
- 5 $(x^3 + x^2) \div x^2 = \dots\dots\dots$
 - a 0
 - b x
 - c x + 1
 - d $2x + 1$
- 6 $\sqrt[3]{a^{15}} = \sqrt{\dots}$
 - a a^5
 - b a^{10}
 - c a^{12}
 - d a^{18}
- 7 A trapezium with a middle base length of 6 cm and height 7 cm, then its area = ...cm²
 - a 13
 - b 42
 - c 30
 - d 26
- 8 If the side length of a rhombus is 5 cm and its height is 4 cm, then its area =cm²
 - a 9
 - b 18
 - c 20
 - d 40
- 9 Which of the following could be a probability of an event occurring?
 - a 1.3
 - b -0.5
 - c 150%
 - d $\frac{2}{3}$
- 10 What is image of the point (5, -4) by rotation $R(0,180^\circ)$ followed by rotation $R(0,-90^\circ)$
 - a (-5, -4)
 - b (-4, -5)
 - c (-5, 4)
 - d (4, 5)
- 11 The probability of the impossible event =
 - a \emptyset
 - b 0
 - c $\frac{4}{5}$
 - d $\frac{1}{2}$

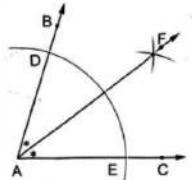


- 12 If the probability of an event occurring is $\frac{1}{5}$, the probability of it not occurring is .
 (a) $\frac{1}{5}$ (b) $\frac{1}{4}$ (c) $\frac{4}{5}$ (d) $\frac{1}{3}$
- 13 Identity rotation is a rotation around the origin 0 by an angle of measure
 (a) 90° (b) 180° (c) 270° (d) 360°
- 14 $\frac{5x^2y - \dots}{5xy} = x - 3y$
 (a) $\frac{3}{5}xy$ (b) $\frac{3}{5}yx^2$ (c) $15x^2y$ (d) $15xy^2$
- 15 If the A (3,5) is the image of the point A by translation $(x,y) \rightarrow (x-1,y+2)$, then the point A is
 (a) (2,7) (b) (4,3) (c) (5,3) (d) (4,-3)
- 16 Which of the following points remains the same when reflected in the y-axis?
 (a) (-7, 0) (b) (0, 3) (c) (-2, 5) (d) (4, -10)
- 17 What is the image of the point (a,b) by reflection in the y-axis ?
 (a) (a,-b) (b) (-a,b) (c) (b,-a) (d) (-b,a)
- 18 What is the image of the point (2,-3) by translation 3 units upwards?
 (a) (5,-3) (b) (5,-6) (c) (2,0) (d) (5,0)
- 19 A trapezium with a height of 5.4 cm and the lengths of its parallel bases are 8 cm and 10 cm , has an area of Square centimeters.
 (a) 48.6 (b) 54 (c) 97.2 (d) 432
- 20 The product of the length of two diagonals of a square is 16 square meters. What is its area in square meters?
 (a) 4 (b) 8 (c) 32 (d) 128
- 21 What is the image of the point (a , b) by translation $(x , y) \rightarrow (x+2 , y-3)$?
 (a) (a-3 , b+2) (b) (a+2 , b-3) (c) (2 , -3) (d) (a+2 , b+3)
- 22 The image of the point is the same point by reflection in the X-axis.
 (a) (-3,0) (b) (0,2) (c) (-4,10) (d) (-2,-5)
- 23 In an experiment of tossing a fair coin once and observing the upper face, what is the probability of obtaining a head (H)?
 (a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) Zero
- 24 $\frac{1}{4}$ of the number 4^8 is
 (a) 4^2 (b) 4^4 (c) 4^6 (d) 4^7



- 25** A trapezium with a middle base length of X cm and a height is equal to half the length of its middle base. What is its area in square centimeters?
 (a) x^2 (b) $\frac{x^2}{2}$ (c) $\frac{x^2}{4}$ (d) $\frac{x^2}{8}$
- 26** If the probability of a student success is 85 %, then the probability of failure is
 (a) 50% (b) 15% (c) $\frac{1}{4}$ (d) $\frac{1}{2}$
- 27** $|\sqrt[3]{-64}| = \dots\dots\dots$
 (a) 8 (b) 4 (c) 2 (d) -4
- 28** If $x-4 > 1$, then which of the following could be the value of x?
 (a) 0 (b) -4 (c) 5 (d) 6
- 29** The sum of the probabilities of all possible outcomes of any random experiment =....
 (a) 50% (b) 1 (c) 0 (d) $\frac{1}{2}$
- 30** In the experiment of forming a 2- different digit number from The set of numbers {1, 2, 3} , the number of elements in the sample space is
 (a) 3 (b) 6 (c) 4 (d) 9
- 31** The length of the middle base in a trapezium is equal to 15 feet and its height is 8 feet. What is it area?
 (a) 30 square feet (b) 120 square feet
 (c) 240 square feet (d) 23 square feet
- 32** In an experiment of tossing a fair coin three consecutive times and observing the upper face, how many elements are there in the sample space?
 (a) 2 (b) 4 (c) 8 (d) 16
- 33** In an experiment of rolling a fair die once, what is Probability of appearing a number less than 5?
 (a) $\frac{1}{6}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$
- 34** Which of the following numbers is in scientific notation?
 (a) 11×10^{11} (b) 75×10^{16} (c) -1.2×10^{-3} (d) 0.05×10^{11}
- 35** The probability of a certain event is
 (a) $\frac{3}{4}$ (b) 100% (c) 0 (d) $\frac{1}{2}$



- 36 If a rhombus with diagonal lengths of 6 inches and 10 inches, then what is its area?
 (a) 30 square inches (b) 60 square inches
 (c) 16 square inches (d) 120 square inches
- 37 The rotation $R(0, 180)$ followed by the rotation $R(0, 180)$ is equivalent to the rotation
 (a) $R(0, 180)$ (b) $R(0, 360)$ (c) $R(0, 90)$ (d) $R(0, -90)$
- 38 In an experiment of rolling a fair die once, what is the probability of appearing a prime even number?
 (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{1}{4}$
- 39 If the area of a rhombus is 18 cm^2 , then the product of its diagonal lengths is cm^2
 (a) 9 (b) 36 (c) 6 (d) 54
- 40 In an experiment of selecting one of the digits randomly from the number 6,543, what is sample space?
 (a) {6, 543} (b) {65, 43} (c) {6, 5, 4, 3} (d) {65, 43, 54}
- In the opposite figure :
- 41 When bisecting $\angle BAC$ with a compass makes you find that:
 $m(\angle BAF) = \dots\dots$
 (a) $m(\angle BFA)$ (b) $m(\angle EAF)$ (c) $m(\angle EFA)$ (d) $m(\angle BAC)$
- 
- 42 What is the image of the point (5, -3) by reflection in the X-axis followed by reflection in the Y-axis?
 (a) (-5, 3) (b) (5, 3) (c) (-5, -3) (d) (-3, -5)
- 43 A trapezium with an area 100 cm^2 and a middle base length 8cm, then its height = cm
 (a) 8 (b) 10 (c) 12 (d) 12.5
- 44 Selecting a ball from a basket containing 6 identical balls, all are blue is
 (a) not a random experiment (b) a simple event
 (c) a random experiment (d) an impossible event
- 47 What rotation makes the image of the point A (2, -5) become the point $A'(-5, -2)$?
 (a) $R(0, 90^\circ)$ (b) $R(0, -90^\circ)$ (c) $R(0, 180^\circ)$ (d) $R(0, 360^\circ)$
- 48 If the area of a square is 50 cm^2 , then the length of its diagonal = Cm
 (a) 10 (b) 100 (c) 25 (d) 15



- 49 In an experiment to form a 2-digit number formed from different digits from the set {2,6,3}, how many elements are there in the event that expresses "the resulting number is even" ?
- (a) 2 (b) 3 (c) 4 (d) 6
- 50 What is the image of the point (3,-9) by rotation $R(0,180^\circ)$ followed by rotation $R(0,-90^\circ)$?
- (a) (-3,-9) (b) (-9,-3) (c) (-3,9) (d) (9,3)
- 51 What is the coefficient of a b in the expansion of the expression $(4a - 5b)^2$?
- (a) -40 (b) 50 (c) 20 (d) 40
- 52 Which of the following cannot be a probability of an event?
- (a) 0.3 (b) -0.3 (c) 31% (d) $\frac{1}{2}$
- 53 Which the following equals $a^{-1} \times a^3$?
- (a) a^2 (b) a^4 (c) $\frac{1}{a^2}$ (d) $\frac{1}{a^3}$
- 54 If the image of the point A (x, y) under rotation $R(0,90)$ is $A'(-2, -5)$ then $x+y=...$
- (a) -3 (b) -7 (c) 3 (d) 7
- 55 A box contains 28 apples, of which 8 are bad. If an apple is drawn randomly from the box, the probability that this apple is not bad is ...
- (a) $\frac{1}{7}$ (b) $\frac{5}{7}$ (c) 1 (d) $\frac{2}{5}$
- 56 A trapezium with parallel base of length 6cm and 10 cm and a height of 6 cm, then its area = ... cm^2
- (a) 16 (b) 48 (c) 360 (d) 180
- 57 If $x \in N$, what is the solution set to the inequality $-x > 3$?
- (a) {-4,-5,...} (b) {4,5,6,...} (c) {-3} (d) \emptyset
- 58 What is the image of the point (2, -3) by rotation around the origin with angle of measure 90° anticlockwise
- (a) (-2, -3) (b) (3, 2) (c) (-2, 3) (d) (2, -3)
- 59 A ball is drawn from a box containing a set of identical balls numbered from 1 to 15, and the number drawn is recorded this is
- (a) a random experiment. (b) not a random experiment
(c) an impossible event. (d) a certain event.



- 60 A rhombus with a side length of 15 cm and diagonal lengths of 18 cm and 24 cm. What is its height?
 (a) 28.8 cm (b) 7.2 cm (c) 14.4 cm (d) 360 cm
- 61 A card carrying a letter from the word "NORHAN" is drawn randomly. What is the probability that this letter is "N"?
 (a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{2}{5}$ (d) $\frac{2}{3}$
- 62 1.82×10^{-5} 2.1×10^{-5}
 (a) < (b) > (c) = (d) other
- 63 If B is an event from a random experiment and $P(B)$ equals $\frac{3}{4}$, then $P(\text{not } B)$ equals ..
 (a) $\frac{1}{4}$ (b) $\frac{2}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$
- 64 If $(x+2)(x-5) = x^2 + bx + c$, then $c = \dots$
 (a) 10 (b) -10 (c) 7 (d) -7
- 65 What is the point whose image by rotation $R(0, 180^\circ)$ is $(-3, 1)$?
 (a) $(3, 1)$ (b) $(1, 3)$ (c) $(-1, 3)$ (d) $(3, -1)$
- 66 What is the area of a square with side length of 6 feet?
 (a) 6 (b) 12 (c) 36 (d) 18
- 67 If the sample space for a random experiment is $S = \{3, 6, 7, 9\}$, then the event of showing a prime number is
 (a) $\{3, 7, 9\}$ (b) $\{3, 6, 7\}$ (c) $\{3, 7\}$ (d) $\{3, 6, 7, 9\}$
- 68 If a rhombus with diagonal lengths of 5 cm and 10 cm, then what is its area?
 (a) 50 cm^2 (b) 25 cm^2 (c) 100 cm^2 (d) 15 cm^2
- 69 $\sqrt{36} + \sqrt{16} = \sqrt{\dots \dots \dots}$
 (a) 100 (b) 120 (c) 52 (d) 10
- 70 If $x+y=4$, and $x^2 - y^2 = 36$, then what is the value of $x - y$?
 (a) 9 (b) 144 (c) 32 (d) 40
- 71 Which of the following equals $3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$?
 (a) 3×7 (b) 7^3 (c) 3^7 (d) $3 + 7$
- 72 Which inequality expresses that two times the number x is greater than or equal to 5?
 (a) $2x \geq 5$ (b) $2x > 5$ (c) $x \geq 5$ (d) $5x \geq 2$



- 73 Which of the following is the largest?
 (a) 5.6×10^{-4} (b) 7.8×10^{-8} (c) 3.6×10^{-3} (d) 5.8×10^{-6}
- 74 If the probability of success of a student is 70%. Then the probability of his failure is
 (a) 0.03 (b) 0.3 (c) 0.07 (d) 0.7
- 75 What is the multiplicative inverse of the number $\sqrt{\frac{9}{25}}$ in the simplest form?
 (a) $-\frac{3}{5}$ (b) $-\frac{5}{3}$ (c) $\frac{3}{5}$ (d) $\frac{5}{3}$

Question 02

Answer the following questions

- 1 In an experiment of tossing a fair coin twice consecutively and observing the sequence of heads and tails, write the sample space (S) and then express each of the following events:

- 1) A is the event "a tail appears on the first toss".
- 2) B is the event "a head appears on only one of the tosses".
- 3) C is the event "the same result appears on both tosses".

$$S = \{(H, H), (H, T), (T, H), (T, T)\}$$

$$1) A = \{(T, H), (T, T)\}$$

$$2) B = \{(T, H), (H, T)\}$$

$$3) C = \{(T, T), (H, H)\}$$

- 2 Find the diagonal length of the square whose area is equal to the area of a rhombus with diagonal lengths of 4 meters and 25 meters.

$$\begin{aligned} \text{The area of the rhombus} &= \frac{1}{2} \times d_1 \times d_2 \\ &= \frac{1}{2} \times 25 \times 4 = 50 \text{ m}^2 \end{aligned}$$

$$\text{The area of the square} = \frac{1}{2} \times d^2$$

$$50 = \frac{1}{2} \times d^2$$

$$d^2 = 100$$

$$d = 10 \text{ m}$$

Diagonal length of the square = 10 m



3 Find the quotient of : $\frac{18x^3 + 12x^2 - 6x}{-6x}$

$$\frac{18x^3 + 12x^2 - 6x}{-6x} = \frac{18x^3}{-6x} + \frac{12x^2}{-6x} - \frac{6x}{-6x} = -3x^2 - 2x + 1$$

4 Calculate the area of a rectangle his length exceeds 3 units than his width, and his width equal x length Units.

$$W = x \quad L = x + 3$$

$$A = x(x + 3)$$

$$= x^2 + 3x$$

5 Simplify to the simplest form : $\frac{x^{-3} \times x^5 \times (-x)^4}{x^2 \times x^{-4} \times x^6}$,

then find the numerical value when $x = 2$?

$$\frac{x^{-3} \times x^5 \times (-x)^4}{x^2 \times x^{-4} \times x^6} = \frac{x^{-3} \times x^5 \times x^4}{x^2 \times x^{-4} \times x^6} = x^{-3+5+4-2+4-6} = x^2$$

$$\text{The numerical value} = (2^2) = 4$$

6 If a card is drawn randomly from identical cards numbered from 20 to 29. Find the probability that the card carries.

a) An even number

c) A number less than 22

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

b) $\frac{1}{5}$

7 If a fair coin was tossed 150 times and heads appeared 48 times, find the experimental probability of appearing:

1) Heads (H)

2) Tails (T)

1) $\frac{48}{150}$

2) $\frac{102}{150}$

8 Find in the simplest form the value of:

$$* \frac{2^{-5} \times 2^8}{2^7 \times 2^{-3}}$$

$$* \frac{a \times a^{-3} \times a^8}{a^5 \times a^{-4}}$$

$$= \frac{2^{-5+8}}{2^{7+(-3)}}$$

$$= \frac{a^{-3+1+8}}{a^{5+(-4)}} = \frac{a^6}{a^1} = a^5$$

$$= \frac{2^3}{2^4} = 2^{-1} = \frac{1}{2}$$



- 9 Find the area of the trapezium whose lengths of the two parallel bases are 7 cm and 15 cm and its height is 8 cm.

$$\text{The area of the trapezium} = \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2}(7 + 15) \times 8 = 88 \text{ cm}^2$$

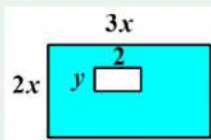
- 10 Find the product of the following algebraic Expressions: $(x-1)(x^2 - 4x + 6)$, then find the numerical value at $x = -2$

$$\begin{aligned} x^3 - 4x^2 + 6x - x^2 + 4x - 6 \\ x^3 - 5x^2 + 10x - 6 \end{aligned}$$

When $x = -2$

$$\therefore (-2)^3 - 5(-2)^2 + 10(-2) - 6 = -54$$

- 11 Find the area of the shaded part in each of the following shapes in the simplest form:



$$A = 6x^2 - 2y$$



$$A = x(2x + y) = 2x^2 + xy$$

- 12 In an experiment of forming a 2-digit number from the set of digits {3, 4, 5}, what is the probability of each of the following events:

- a) A the event that the tens is odd?
 b) B the event that the sum of the two digits is 8?
 c) C the event that the product of the two digits equals 20?

$$\text{a) } P(A) = \frac{6}{9} = \frac{2}{3}$$

$$\text{b) } P(B) = \frac{3}{9}$$

$$\text{c) } P(C) = \frac{2}{9}$$

- 13 Find in the simplest form :

$$\left(\frac{5^3 \times 5^{-2}}{5^4 \times 5^{-1}} \right)^{-2}$$

$$= \left(\frac{5}{5^3} \right)^{-2} = (5^{1-3})^{-2} = (5^{-2})^{-2}$$

$$= 5^4 = 625$$



- 14 Find in simplest form the product $(x - 3)(2x^2 - x + 4)$ and then find the numerical value of the result when $x = -1$

$$\begin{aligned} &(x - 3)(2x^2 - x + 4) \\ &2x^3 - x^2 + 4x - 6x^2 + 3x - 12 \\ &2x^3 - 7x^2 + 7x - 12 \\ &\text{The numerical value} = -28 \end{aligned}$$

- 15 A cube has a lateral surface area of 324 square. Find the perimeter of its base lateral area

lateral surface area = 324

$$4s^2 = 324$$

$$s^2 = 81$$

$$s=9\text{cm} \quad , \quad p = 4s = 4 \times 9 = 36\text{cm}$$

- 16 If card is drawn at random from identical cards numbered from 5 to 15, find the probability that the card carries a number:

- 1) prime 2) even 3) greater than 12

1) $\frac{4}{11}$

2) $\frac{5}{11}$

3) $\frac{3}{11}$

- 17 Find the value of b that makes the expression $(4x^2 + 19x + b)$ by $(4x - 1)$

$$\begin{array}{r} \overline{) 4x^2 + 19x + b} \\ \underline{4x^2 - x} \\ 20x + b \\ \underline{20x - 5} \\ b = -5 \end{array}$$

- 18 Simplify: $(\frac{3}{2})^2 + \sqrt{\frac{25}{4}} + \sqrt[3]{\frac{125}{64}}$

$$\frac{9}{4} + \frac{5}{2} + \frac{5}{4} = \frac{9}{4} + \frac{10}{4} + \frac{5}{4} = \frac{24}{4} = 6$$



19 Find the solution set for each of the following in \mathbb{Q}

1) $x^3 + 26 = -1$

2) $2(X+3) \leq 3(X-4)$

$x^3 = -1 - 26$

$2x + 6 \leq 3x - 12$

$x^3 = -27$

$2x - 3x \leq -12 + (-6)$

$-x \leq -18$

$X = -3$

$x \geq 18$

20 Find the length of the diagonal of the square whose area equal to the area of a rhombus with diagonal lengths of 4 meters and 16 meters.

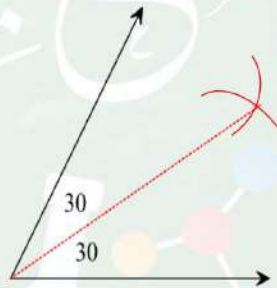
$A1 = \frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 4 \times 16 = 32m^2$

$\therefore \text{The area of the square} = 32 m^2$

$A2 = \frac{1}{2} \times d^2$

$\therefore 32 = \frac{1}{2} \times d^2 \therefore d^2 = 64 \therefore d = \sqrt{64} = 8 m$

21 Draw an angle of measure 60° , then bisect it using A ruler and compass.



Express each of the following situations with an appropriate inequality :

22 a) The maximum speed of your car is 80 Km \ h

b) If 2 is subtracted from three times a number, the result is greater than 7.

a) $f \leq 80$

b) $3x - 2 > 7$

23 A box contains one red ball, five blue balls, four White balls, all of which are identical. If a ball is drawn Randomly from the bag and its colour is observed, what is the probability that the drawn ball is:

1) Red?

2) Green?

3) Blue or White?

1) $P(R) = \frac{1}{10}$

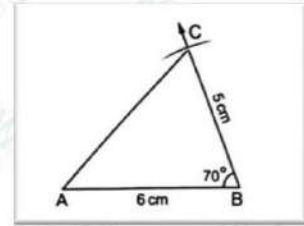
2) $P(G) = 0$

3) $P(B \text{ or } W) = \frac{9}{10}$



- 24 Draw $\triangle ABC$ where $AB = 6 \text{ cm}$, $BC = 5 \text{ cm}$ and $m(\angle B) = 70^\circ$, then determine the type of triangle according to the measures of its angles.

From the figure the triangle is an acute - angled triangle



- 25 Find the solution set of the inequality $2(3x - 1) \geq 4x - 3$ in \mathbb{Q}

$$2(3x - 1) \geq 4x - 3$$

$$6x - 2 \geq 4x - 3$$

$$6x - 4x \geq -3 + 2$$

$$2x \geq -1$$

$$x \geq \frac{-1}{2}$$

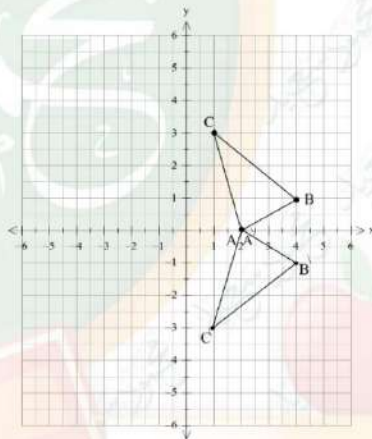
The solution set = $\{x : x \in \mathbb{Q}, x \geq \frac{-1}{2}\}$

- 26 Draw the triangle ABC where: $A(2, 0)$, $B(4, 1)$, $C(1, 3)$, then draw its image under reflection in the x-axis

$$A(2, 0) \quad \hat{A}(2, 0)$$

$$B(4, 1) \quad \hat{B}(4, -1)$$

$$C(1, 3) \quad \hat{C}(1, -3)$$



- 27 In the experiment of throwing a regular die once and observing the number that appears on its upper face. Write the sample space, then write each of the following events

1) A is the event of getting a number divisible by 2?

2) B is the event of getting an odd number that is not prim

3) C is the event of getting a number greater than or Equal to 4

4) D is the event of getting a number less than 6

$$1) \frac{3}{6} = \frac{1}{2}$$

$$2) \frac{1}{6}$$

$$3) \frac{3}{6} = \frac{1}{2}$$

$$4) \frac{5}{6}$$



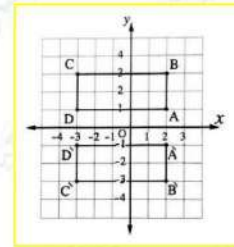
- 28 Draw the rectangle ABCD where A (2, 1), B (2, 3), C (-3, 3), and D (-3, 1), then draw its image by reflection in the X-axis.

By reflection in the X-axis

$$A (2,1) \rightarrow \hat{A} (2, -1)$$

$$B (2,3) \rightarrow \hat{B} (2,-3)$$

$$C (-3,3) \rightarrow \hat{C} (-3,-3)$$



- 29 Which has a greater area?

A rhombus with diagonals lengths of 6 cm and 10 cm or square with a diagonal length 8 cm.

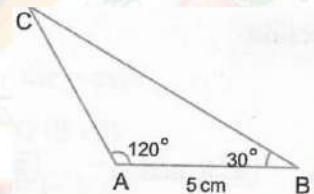
$$\begin{aligned} \text{The area of rhombus} &= \frac{1}{2} d_1 \times d_2 = \frac{1}{2} \times 6 \times 10 \\ &= 30\text{cm}^2 \end{aligned}$$

$$\text{The area of square} = \frac{1}{2} d^2 = \frac{1}{2} 8^2 = 32\text{cm}^2$$

a greater area (square)

- 30 Draw the triangle ABC where AB = 5cm, $m(\angle A) = 120^\circ$, $m(\angle B) = 30^\circ$ and determine by measuring the type of the triangle according to the length of its sides

From the drawing the triangle is an isosceles triangle, where $AB = AC = 5\text{ cm}$



- 31 Simplify to the simplest form : $\sqrt{\frac{4}{25}} + \left(\frac{-3}{2}\right)^0 + \sqrt[3]{\frac{27}{125}}$

$$\frac{2}{5} + 1 + \frac{3}{5} = 1 + \frac{5}{5} = 2$$

- 32 Write the sample space of the random experiment of drawing a card from a set of identical cards numbered from 20 to 25 and observing the number written on the drawn card

$$s = \{20, 21, 22, 23, 24, 25\}$$

$$n(s) = 6$$



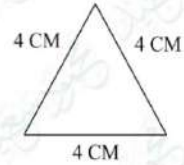
33 If $x = -2$ and $y = 3$, Find the numerical value of each of the following:

1) $x^y = \dots$ 2) $(-y)^3 = \dots$ 3) $(x + y)^2 = \dots$

1) $x^y = -8$ 2) $(-y)^3 = -27$ 3) $(x + y)^2 = 1$

34 Draw an equilateral triangle with a perimeter of 12 cm.

The side length of the triangle = $12 \div 3 = 4 \text{ cm}$



35 Find the quotient of: $\frac{9ab^2 + 18a^2b - 6a^2b^2}{3ab}$

$3b + 6a - 2ab$

36 Find the solution set in \mathbb{Q} for the inequality:

$3(x + 2) \geq 5x + 2$

$3x + 6 \geq 5x + 2$

$3x - 5x \geq 2 - 6$

$-2x \geq -4$

$x \leq 2$

37 If a card is drawn randomly from identical cards numbered from 5 to 18, find the probability that the drawn card carries :

- 1) An odd number.
- 2) An even number greater than 10.
- 3) A perfect square.
- 4) A number less than 5.

1) $\frac{1}{2}$

2) $\frac{2}{7}$

3) $\frac{1}{7}$

4) Zero

38 write the result in scientific notation: $(8 \times 10^4) \div (3.2 \times 10^{-3})$

$= 2.5 \times 10^7$

39 In your personal library, you have 20 scientific books, 15 literary books, and 5 historical books. If you choose a book at random, what is the probability of selecting a scientific book?

$\frac{20}{40} = \frac{1}{2} = 0.1570$



40 write the result in scientific notation: $(2.1 \times 10^4) + (4.1 \times 10^5)$

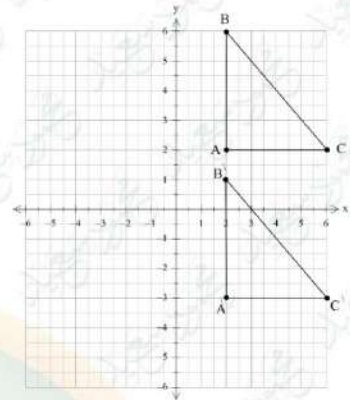
$$(2.1 + 41) \times 10^4 = 43.1 \times 10^4 = 4.31 \times 10^5$$

41 Draw triangle ΔABC , $A(2,2)$, $B(2,6)$, $C(6,2)$
by translation $(x, y) \rightarrow (x + 0, y - 5)$?

$$A(2, 2) \rightarrow \hat{A}(2, -3)$$

$$B(2, 6) \rightarrow \hat{B}(2, 1)$$

$$C(6, 2) \rightarrow \hat{C}(6, -3)$$



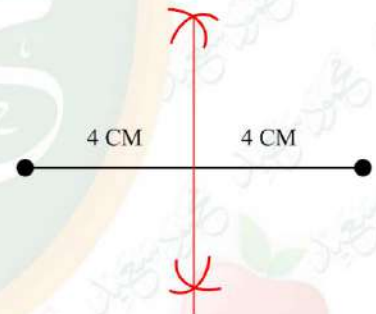
42 Write the result of the following in scientific notation:

$$(5.2 \times 10^9) - (8.5 \times 10^8)$$

$$= (52 \times 10^8) - (8.5 \times 10^8)$$

$$= (52 - 8.5) \times 10^8 = 43.5 \times 10^8 = 4.35 \times 10^9$$

43 Draw a line segment \overline{AB} of length 8 cm , then bisect it using a ruler and compass.



44 Arrange the following numbers in an ascending order :

$$5\,400\,000, 7.1 \times 10^6, 1.2 \times 10^7, 0.95 \times 10^7$$

$$5\,400\,000 < 7.1 \times 10^6 < 0.95 \times 10^7 < 1.2 \times 10^7$$

47 In an experiment of rolling a fair die once and observing the number that appears on the upper face, write the sample space and then determine each of the following events, indicating which is simple, certain, or impossible :

- 1) Event (A) is the event of appearing a number divisible by 5
- 2) Event (B) is the event of appearing a number that satisfies the inequality $X > 6$
- 3) Event (C) is the event of appearing an odd number that is not prime.
- 4) Event (D) is the event of appearing a number less than 10
- 5) Event (E) is the event of appearing a perfect cube.

$$S = \{1, 2, 3, 4, 5, 6\}$$

$$1) A = \{5\} \text{ (Simple event)}$$

$$2) B = \emptyset \text{ (Impossible event)}$$



3) $C = \{1\}$ (Simple event)

4) $D = \{1, 2, 3, 4, 5, 6\}$ (Certain event)

5) $E = \{1\}$ (Simple event)

- 48) The area of rectangle $35x^6 - 15x^5 + 40x^2$ square units , one of its dimension is $5x^2$ unit length . find the other dimension .

The other length = $7x^4 - 3x^3 + 8$

- 49) The area of a square equals the area of a triangle with a base length of 9 cm and a height corresponding to this base of 8 cm. Find the length of the square's side.

The area of the triangle = $\frac{1}{2} \times 9 \times 8 = 36$ square centimeters

The area of the square = 36 square centimeters

∴ The length of the side of the square = $\sqrt{36} = 6$ cm

- 50) Write the number 128 by using prime factors and exponents.

$128 = 2^7$

- 51) Arrange each of the following in an ascending Order:

4200 000, 3.4×10^6 , 0.37×10^7

→ 3.4×10^6 , 0.37×10^7 , 4200 000

- 52) Simplify to its simplest form: $\sqrt[3]{0.064} \times \sqrt{\frac{25}{9}} \times \left(\frac{2}{5}\right)^0$

$= \frac{2}{5} \times \frac{5}{3} \times 1 = \frac{2}{3}$

- 53) A trapezium has an area of 315 square centimeters and a height of 15 cm , If the ratio between the lengths of its two bases is 3 : 4 . What is the length of each base ?

The length of the middle base = $= \frac{\text{the area}}{\text{height}} = \frac{315}{15} = 21$ cm

First base : Second base : Sum

3 : 4 : 7
: : : 42

The value of one part = $42 \div 7 = 6$

The length of first base = $3 \times 6 = 18$ cm

The length of second base = $4 \times 6 = 24$ cm



54 Solve equation in Z : $2x(x - 5) + 10x = 50$

$$2x^2 - 10x + 10x = 50$$

$$2x^2 = 50, x^2 = \frac{50}{2} = 25, x = \pm\sqrt{25} = \pm 5$$

55 A bag contains 40 identical marbles. Mostafa draws randomly a marble if the marble is red, and the probability of drawing a red marble is $\frac{3}{8}$, then find the number of red marbles in the bag.

$$\text{Number of red marbles} = \frac{3}{8} \times 40 = 15 \text{ marbles}$$

56 Write the number 200 by using prime factors and exponents.

$$200 = 2^3 \times 5^2$$

57 If $a = \frac{2}{3}$, and $b = -\frac{4}{3}$, then find the value of : $|b^3 \div a^3|$

$$|-8| = 8$$

58 Find the value of x in $x^2 - 5 = 5x^2 + 13$?

$$7x^2 - 5x^2 = 13 + 5$$

$$X = \pm 3$$

59 A box contains 12 red balls, 3 blue balls, and 5 black balls, all of which are identical. If one ball is drawn randomly, calculate the probability that the drawn ball is :

1) Black. 2) Not red. 3) Blue or red. 4) Green.

1) $\frac{1}{4}$ 2) $\frac{2}{5}$ 3) $\frac{3}{4}$ 4) Zero

60 If $3^4 + 3^4 + 3^4 = 3^n$, then find the value of n ?

$$3^4 + 3^4 + 3^4 = 3^n$$

$$3 \times 3^4 = 3^n$$

$$3^{1+4} = 3^n$$

$$3^5 = 3^n$$

$$n = 5$$

61 Simplify to its simplest form:

a) $3a(4a-2) - 4a(3a-2)$

b) $(2x + 3)^2$

a) $12a^2 - 6a - 12a^2 + 8a = 2a$

b) $4x^2 + 12x + 9$



- 62** If a fair coin was tossed 50 times and head appeared 30 times, find the experimental probability of appearing :
- 1) Head (H) 2) Tail (T)

1) $\frac{3}{5}$ 2) $\frac{2}{5}$

- 63** Find the product : $(x - 3)(4x^2 + 2x - 7)$

$4x^3 - 10x^2 - 13x + 21$

- 64** Find the simplest form of $\frac{(-a)^3 \times a^5}{(-a)^4 \times a^2}$?

$= \frac{-a^3 \times a^5}{a^4 \times a^2} = -a^2$

- 65** If $(35x^2y^3 - 20xy) \div 5x = nxy^3 - 4y$, then find the value of n.

$7xy^3 - 4y = nxy^3 - 4y$

$\therefore n = 7$

- 66** Arrange each of the following in a descending Order:

$7.3 \times 10^7, 1.69 \times 10^8, 2.1 \times 10^7, 1.4 \times 10^7$

$\rightarrow 1.69 \times 10^8, 7.3 \times 10^7, 2.1 \times 10^7, 1.4 \times 10^7$

- 67** A trapezium has an area of 72 cm^2 and a height of 9 cm. If the length of one of its bases is 6 cm, find the length of its other base.

$A = \frac{1}{2}(b_1 + b_2) \times h$

$72 = \frac{1}{2}(6 + x) \times 9$

$(6 + x) \times 9 = 72 \times 2$

$(6 + x) \times 9 = 144$

$6 + x = \frac{144}{9}$

$6 + x = 16$

$\therefore x = 10$



- 68 A cuboid with a volume of $(4x^2 + 12xy + 9y^2)$ cubic units and its base area of $(2x + 3y)$ square units. Find its height in terms of x and y

$$\begin{array}{r} 2x+3y \overline{) 4x^2+12xy+9y^2} \\ \underline{4x^2+6xy} \\ 6xy+9y^2 \\ \underline{6xy+9y^2} \\ 0 \end{array}$$

- 69 Find the image of the polygon ABCD by rotation $R(0, -270^\circ)$ where $A(2,0)$, $B(2,4)$, $C(0,4)$, $D(0,2)$.

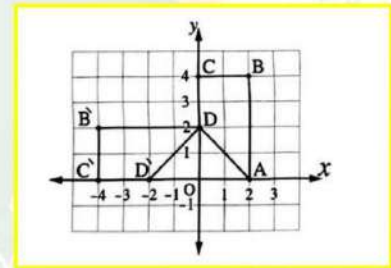
by rotation $R(0, -270^\circ)$:

$A(2,0) \rightarrow \hat{A}(0,2)$

$B(2,4) \rightarrow \hat{B}(-4,2)$

$C(0,4) \rightarrow \hat{C}(-4,0)$

$D(0,2) \rightarrow \hat{D}(-2,0)$



- 70 In an experiment to form a 2-digit number from the set of digits $\{1,7,2\}$, what is the probability of each of the following events:

- 1) A is the event that the sum of the two digits is 8 ?
- 2) B is the event that the tens digit is even?
- 3) C is the event that the tens digit = the once digit ?

1) $\frac{2}{9}$

2) $\frac{1}{3}$

3) $\frac{1}{3}$

- 71 Find the solution set for each of the following equations in Q :

a) $x(x - 3) + 3(x - 27) = 0$

b) $3x^3 - 4 = 2x^3 + 4$

a) $x^2 - 3x + 3x - 81 = 0$

$x^2 - 81 = 0$ ----- $x^2 = 81$

$x = \pm \sqrt{81} = \pm 9$ -----

The solution set = $\{9, -9\}$

b) $3x^3 - 4 = 2x^3 + 4$

$3x^3 - 2x^3 = 4 + 4$

$x^3 = 8$

$x = \sqrt[3]{8} = 2$

The solution set = $\{2\}$



72 Find the solution set for each of the following in \mathbb{Q} :

1) $3x^3 + 3 = 84$

$$3x^3 = 81$$

$$x^3 = 27$$

$$x = 3$$

2) $5x^2 - 2 = 43$

$$5x^2 = 43 + 2$$

$$x^2 = 9$$

$$x = \pm 3$$

انتهت الأسئلة مع أطيب الامنيات بالنجاح والتوفيق

محمود سعيد

