

MATH

Feb & Mar Revision

2nd Prep



Revision by Ahmed Nassr

أحمد نصر



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Q1: Choose the correct answer

1 If $\frac{a}{4} = \frac{b}{3}$, What's the value of $\frac{a+b}{a-b}$?

(a) $\frac{7}{4}$

(b) $\frac{4}{3}$

(c) $\frac{1}{7}$

(d) 7

2 If a, b, 2, 3 are proportional, then $\frac{b}{a} = \dots\dots\dots$

(a) $\frac{3}{2}$

(b) $\frac{2}{3}$

(c) 3

(d) 2

3 If $4x^2 = 9y^2$, then $\frac{x}{y} = \dots\dots\dots$

(a) $\frac{9}{4}$

(b) $\frac{3}{2}$

(c) $\pm \frac{3}{2}$

(d) $\pm \frac{2}{3}$

4 If $5a - 4b = 0$, then $\frac{a}{b} = \dots\dots\dots$

(a) $\frac{4}{5}$

(b) $\frac{5}{4}$

(c) $\frac{-4}{5}$

(d) $\frac{-5}{4}$

5 If $\frac{4}{x} = \frac{7}{y} = \frac{b}{y-x}$, then b =

(a) 3

(b) -3

(c) 11

(d) -11

6 If $\frac{a}{b} = \frac{c}{d} = k$ where $k \neq 0$, then $\frac{a \times c}{b \times d} = \dots\dots\dots$

(a) $2k^2$

(b) k^2

(c) k

(d) 2k

7 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

(a) 9

(b) 13

(c) 14

(d) 8

8 The positive middle proportional between a and b is

(a) \sqrt{ab}

(b) $-\sqrt{ab}$

(c) $\pm\sqrt{ab}$

(d) ab

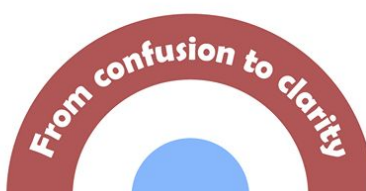
9 The third proportional of 9 and -12 is

(a) -16

(b) 8

(c) 16

(d) 108



10 The middle proportional between 5 and 20 is

- (a) 10 (b) -10 (c) 100 (d) ± 10

11 The middle proportional between $(x - 2)$ and $(x + 2)$ is

- (a) $\sqrt{x + 2}$ (b) $\sqrt{x^2 - 4}$ (c) $x^2 - 4$ (d) $\pm \sqrt{x^2 - 4}$

12 If a, 3, 9, b are continued proportional quantities, find the value of: $b + a =$

- (a) 3 (b) 9 (c) 27 (d) 28

13 If $\frac{a}{5} = \frac{b}{7}$, then $7a - 5b + 3 =$

- (a) 3 (b) 7 (c) 5 (d) 2

14 If a, x, b and 2x are proportional quantities, then $a : b =$

- (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 1 : 4

15 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then the value of $\frac{a + d}{d} =$

- (a) 5 (b) 7 (c) 8 (d) 9

16 If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a + c}{b + d} =$

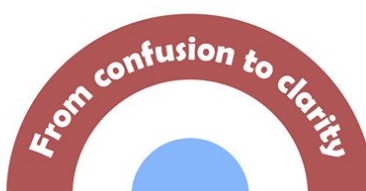
- (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{6}{5}$ (d) $\frac{5}{6}$

17 If a is the first proportional for the numbers 4 and 16, what is the value of a?

- (a) 1 (b) 2 (c) 4 (d) 8

18 What is the fourth proportional for the quantities 2, 4, 5?

- (a) 12 (b) 10 (c) 3 (d) 6



19 If 6 is the middle proportional between m and 2, then m =

- (a) 8 (b) 12 (c) 18 (d) 36

20 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, then a =

- (a) 5×2^2 (b) 40 (c) 10 (d) 2×5^3

21 If a, 2, 4, b are in a continued proportional, then a + b =

- (a) 1 (b) 8 (c) 7 (d) 9

22 If x, 4, y, 5 are proportional quantities, then x : y =

- (a) 4 : 5 (b) 5 : 4 (c) 4 : 1 (d) 5 : 1

23 The number that must be added to the numbers 1,3,6 to be in a continued proportional is

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

24 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

- (a) 9 (b) 14 (c) 13 (d) 8

25 What's the third proportional for $x^4, 2x^3$?

- (a) $2x^2$ (b) $2x$ (c) $4x^3$ (d) $4x^2$

26 If: $3a = 5b = 4c$, then a : b : c equals

- (a) 9 : 12 : 16 (b) 20 : 12 : 15 (c) 15 : 10 : 9 (d) 8 : 5 : 3



Q2: Answer The Following

1 Find the value of x if the numbers x, 24 and 144 are proportional.

2 Find the number that if added to the numbers 3, 5, 9, and 13 it becomes proportional.

3 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, find the value of: $\frac{x - y + z}{2x + y}$.

4 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{4b + 7d}{4b + 7c} = \frac{5b - 8d}{5a - 8c}$$

5 The mean proportional between the numbers 3 and 48 equals.....



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$$x = \frac{\sqrt{b^2 + c^2} - b}{c}$$



$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

6 If b is the middle proportional between a and c, Prove that: $\frac{3a + 4b}{3b + 4c} = \frac{a}{b}$

7 If $\frac{x - 2y}{x + 3y} = \frac{1}{3}$, Find the value of $\frac{y}{x}$

8 If 4, a, $\frac{1}{9b^2}$ are in continued proportion. Find the value of ab

9 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{a + b}{b} = \frac{c + d}{d}$$

10 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, and $x + y - 2z = 12$ Find the value of z



$$x = \frac{\sqrt{b^2 + c^2} - b}{c}$$



$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

11 If b is the middle proportional between a and c, Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

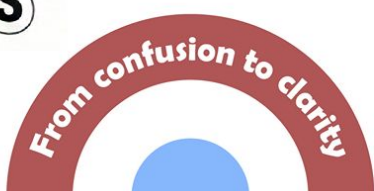
12 Find the value of x, y if the quantities 2, x, y and 54 are in a continued proportion.

13 Find the number that if added to the two terms of the ratio 7 : 11 it becomes 2 : 3

14 If $\frac{a+b}{b} = \frac{c+d}{d} = \frac{c+d}{d}$, Find the value of $\frac{x+y+z}{x-y}$



Follow for More!



Q1: Choose the correct answer

1 If $(a + 5, 3) = (8, b - 1)$ then $\sqrt{a^2 + b^2}$

- (a) 7 (b) 3 (c) 9 (d) 5

2 If $n(X^2) = 9$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

- (a) 2 (b) 3 (c) 4 (d) 8

3 If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

- (a) 3 (b) ± 3 (c) 9 (d) ± 9

4 If $n(X) = 2$ and $Y = \{1, 2\}$, then $n(X \times Y) = \dots\dots\dots$

- (a) 4 (b) 3 (c) 5 (d) 6

5 If $(3, 5) \in \{(3, x), (3, 8), (6, 8)\}$, then $X = \dots\dots\dots$

- (a) 8 (b) 3 (c) 5 (d) 6

6 If $X = \{1, 2\}$ and $Y = \{3, 4\}$, then $(3, 4) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

7 If $X = \{2\}$ and $Y = \{3\}$, then $X \times Y = \dots\dots\dots$

- (a) 6 (b) $\{6\}$ (c) $(2, 3)$ (d) $\{(2, 3)\}$

8 If $X = \{3, 4\}$, then $n(X \times \emptyset) = \dots\dots\dots$

- (a) 0 (b) 1 (c) 2 (d) \emptyset

9 If $n(X \times Y) = 6$ and $Y = \{2\}$, then $n(X^2) = \dots\dots\dots$

- (a) 4 (b) 9 (c) 16 (d) 36



9 If the point $(a, 5) \in Y$ -axis, then $a = \dots\dots\dots$

- (a) 0 (b) 5 (c) -5 (d) 25

10 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

- (a) 1 (b) -1 (c) ± 1 (d) 0

11 If the point $(3, b - 5)$ lies on the x -axis, then $2b + 1 = \dots\dots\dots$

- (a) Zero (b) 5 (c) 11 (d) 8

12 What is the S.S. for the inequality: $3 \geq x > -3$ in R ?

- (a) $] -3, 3[$ (b) $] -3, 3]$ (c) $[-3, 3[$ (d) $[-3, 3]$

13 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to?

- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$

14 If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- (a) 8 (b) 9 (c) 11 (d) 12

15 If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where:
 $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k ?

- (a) 5 (b) 7 (c) 8 (d) 9

16 If $(k^2 - 4, k)$ lies on the negative direction of Y -axis, then $k = \dots\dots\dots$

- (a) 2 (b) ± 2 (c) -2 (d) 0

17 If $f(x + 3) = x - 3$, then $f(7) = \dots\dots\dots$

- (a) 4 (b) 1 (c) 7 (d) 10

18 If $f(x) = 3$, then $f(-5) - f(5) = \dots\dots\dots$

- (a) 6 (b) 1 (c) zero (d) -1



19 What is the S.S. for the inequality: $5x \leq 25$ in \mathbb{R} ?

- (a) $]-\infty, 5[$ (b) $]5, \infty[$ (c) $[5, \infty[$ (d) $]-\infty, 5]$

20 If $f(x) = 4$, then $f(4) \div f(10) = \dots\dots\dots$

- (a) 4 (b) $\frac{2}{5}$ (c) 1 (d) 10

21 If $R = \{(1,3), (2,5), (4,3)\}$ represent a function, then its domain = $\dots\dots\dots$

- (a) {1, 2, 4} (b) {3, 5, 4} (c) \mathbb{Z} (d) \mathbb{N}

22 If $f(x) = kx + 8$ and $f(2) = 0$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) -4

23 $f(x) = 3x$ is represented by a straight line passes through the point $\dots\dots\dots$

- (a) (3, 3) (b) (3, 0) (c) (0, 0) (d) (0, 3)

24 If $f(x) = 5$, then $f(-3) = \dots\dots\dots$

- (a) 5 (b) -5 (c) -3 (d) -15

25 If $(a, 3)$ lies on the straight line that represents $f(x) = 2x - 5$, then $a = \dots\dots\dots$

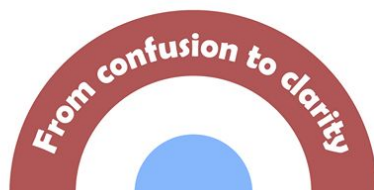
- (a) 2 (b) 1 (c) -2 (d) 4

26 If $f(x) = 3x + b$ and $f(4) = 13$, then $b = \dots\dots\dots$

- (a) 1 (b) 2 (c) 0 (d) 3

27 If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- (a) 3 (b) 4 (c) 5 (d) 6



28 If $f(x) = x^2$, $g(x) = x + 4$, what is the value of $5f(2) + 2g(5)$?

- (a) 18 (b) 20 (c) 38 (d) 70

29 If $(a, a) \in f$ where $f(x) = 2x + 3$, then $a = \dots\dots\dots$

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

30 If R is a relation where $R = \{(1, 7), (2, 8), (3, 7), (5, 8)\}$, Then the range = $\dots\dots\dots$

- (a) {1, 2, 3, 5} (b) {7, 8, 5} (c) {7, 8} (d) {1, 2, 7, 8}

31 If $(x, 7)$ is located on Y-axis, then $5x + 1 = \dots\dots\dots$

- (a) 0 (b) 1 (c) 5 (d) 6

32 The ordered pair $(1, 2)$ belongs to the function f where: $\dots\dots\dots$

- (a) $f(x) = 2x - 1$ (b) $f(x) = -3x + 7$ (c) $f(x) = 2x + 1$ (d) $f(x) = -3x + 5$

33 The straight line representing the function f where $f(x) = 3x - 12$ cuts the x-axis at the point:

- (a) $(-12, 0)$ (b) $(12, 0)$ (c) $(4, 0)$ (d) $(-4, 0)$

34 What is the solution set of the inequality $-x > 3$ in R?

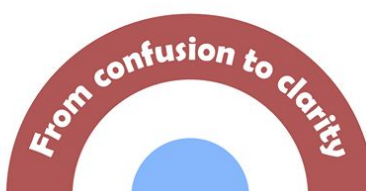
- (a) $]-\infty, -3[$ (b) $]-\infty, 3[$ (c) $]-3, \infty[$ (d) $]3, \infty[$

35 If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

- (a) -7 (b) -1 (c) 1 (d) 7

36 The interval $[-1, 2[$ is the solution set in R for the inequality: $\dots\dots\dots$

- (a) $-1 < x < 2$ (b) $-1 < x \leq 2$ (c) $-1 \leq x < 2$ (d) $-1 \leq x \leq 2$



37) If the straight line that represents the function $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

- (a) -3 (b) 2 (c) 0 (d) 3

38) What is the solution set of the inequality $5 > -x > -3$ in R ?

- (a) $[-5, 3]$ (b) $] -5, 3 [$ (c) $[-3, 5]$ (d) $] -3, 5 [$

Q2: Answer The Following

1) If $X = \{1, 3, 7\}$, $Y = \{5, 9\}$, find $X \times Y$, Y^2

2) Find the solution set for each of the following inequalities in R :

- (a) $2x + 3 < 6$ (b) $5 - 3x \geq 2$
- (c) $11 > 3x + 2 > -4$ (d) $-8 \leq 4 - 3(x + 1) < 10$

3) Represent graphically the function f where $f(x) = 3x - 1$



4 If $X = \{0, 1, 2, 3\}$, $Y = \{6, 7, 8, 9, 10\}$ and R is a relation from X to Y where " xRy " means " $x+y = 10$ " for every $x \in X, y \in Y$ write the relation as a set of ordered pairs, then represent the relation with an arrow diagram stating the domain and the range of the relation. Does the relation represent a function or not? why?

5 If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k

6 If $f(x) = 2x^2 - 5x + 2$, prove that $f(2) = f(\frac{1}{2})$

7 If the straight line which represents the function $f(x) = ax + b$ intersects X -axis at $(3, 0)$ and Y -axis at $(0, -3)$, find the value of a and b

8 If $X \times Y = \{(2, 3), (2, 6), (2, 7)\}$, Find:

a) X and Y .

b) Y^2

c) $n(X^2)$



9 If $X = \{1, 3, 5\}$ and R is a function on X , and relation R is $\{(a, 3), (b, 1), (1, 5)\}$. Find:

- a The range of the function
- b The numerical value of the expression: $a + b$

10 Find the solution set of the inequality: $-3 < 2x + 5 < 13$ in R .

11 If $X = \{1, 2\}$, $Y = \{2, 3, 4\}$, find:

- a $(X \cap Y) \times X$
- b $(X - Y) \times Y$
- c $n(X^2)$

12 If $X = \{2, 1, 0, -1, -2\}$, and R is a relation on X , where aRb means (a is the additive inverse of b) for every $a, b \in X$.

Write the relation R and represent it with a Cartesian diagram.

13 If the straight line for the function $f : R \rightarrow R$ where $f(x) = 6x - a$ cuts Y-axis at the point $(b, 3)$. Find the value of $2a + 7b$.



14) If $(x + 3, 8) = (5, 2y)$, then find the value of x and y .

15) If $x = \{1, 3, 4, 5\}$, $y = \{1, 2, 3, 4, 5, 6\}$ and R is a relation from X to Y where " aRb " means " $a + b = 7$ " for each $a \in X, b \in Y$

- a) Write R and represent it with an arrow diagram.
- b) Show if R is a function or not, and why? If it is a function, find its range.

16) If R is a relation from X to Y and $R = \{(2, 2), (0, 2), (3, 1), (4, 2)\}$

- a) Write the relation in a table form.
- b) Represent the relation graphically.
- c) Find the domain and the range of the relation



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a $\frac{7}{4}$

b $\frac{4}{3}$

c $\frac{1}{7}$

d 7

2 If a, b, 2, 3 are proportional, then $\frac{b}{a} = \dots\dots\dots$

a $\frac{3}{2}$

b $\frac{2}{3}$

c 3

d 2

3 If $4x^2 = 9y^2$, then $\frac{x}{y} = \dots\dots\dots$

a $\frac{9}{4}$

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c $\pm \frac{3}{2}$

d $\pm \frac{2}{3}$

4 If $5a - 4b = 0$, then $\frac{a}{b} = \dots\dots\dots$

a $\frac{4}{5}$

b $\frac{5}{4}$

c $\frac{-4}{5}$

d $\frac{-5}{4}$

5 If $\frac{4}{x} = \frac{7}{y} = \frac{b}{y-x}$, then b =

a 3

b -3

c 11

d -11

6 If $\frac{a}{b} = \frac{c}{d} = k$ where $k \neq 0$, then $\frac{a \times c}{b \times d} = \dots\dots\dots$

a $2k^2$

b k^2

c k

d 2k

7 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

a 9

b 13

c 14

d 8

8 The positive middle proportional between a and b is

a \sqrt{ab}

b $-\sqrt{ab}$

c $\pm\sqrt{ab}$

d ab

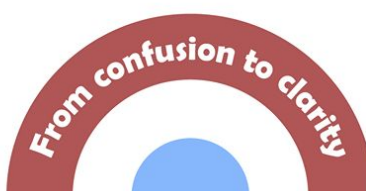
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a -16

b 8

c 16

d 108



10 The middle proportional between 5 and 20 is

- (a) 10 (b) -10 (c) 100 (d) ± 10

11 The middle proportional between $(x - 2)$ and $(x + 2)$ is

- (a) $\sqrt{x + 2}$ (b) $\sqrt{x^2 - 4}$ (c) $x^2 - 4$ (d) $\pm \sqrt{x^2 - 4}$

12 If a, 3, 9, b are continued proportional quantities, find the value of: $b + a =$

- (a) 3 (b) 9 (c) 27 (d) 28

13 If $\frac{a}{5} = \frac{b}{7}$, then $7a - 5b + 3 =$

- (a) 3 (b) 7 (c) 5 (d) 2

14 If a, x, b and $2x$ are proportional quantities, then $a : b =$

- (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 1 : 4

15 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then the value of $\frac{a + d}{d} =$

- (a) 5 (b) 7 (c) 8 (d) 9

16 If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a + c}{b + d} =$

- (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{6}{5}$ (d) $\frac{5}{6}$

17 If a is the first proportional for the numbers 4 and 16, what is the value of a?

- (a) 1 (b) 2 (c) 4 (d) 8

18 What is the fourth proportional for the quantities 2, 4, 5?

- (a) 12 (b) 10 (c) 3 (d) 6



19 If 6 is the middle proportional between m and 2, then m =

- (a) 8 (b) 12 (c) 18 (d) 36

20 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, then a =

- (a) 5×2^2 (b) 40 (c) 10 (d) 2×5^3

21 If a, 2, 4, b are in a continued proportional, then a + b =

- (a) 1 (b) 8 (c) 7 (d) 9

22 If x, 4, y, 5 are proportional quantities, then x : y =

- (a) 4 : 5 (b) 5 : 4 (c) 4 : 1 (d) 5 : 1

23 The number that must be added to the numbers 1,3,6 to be in a continued proportional is

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

24 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

- (a) 9 (b) 14 (c) 13 (d) 8

25 What's the third proportional for $x^4, 2x^3$?

- (a) $2x^2$ (b) $2x$ (c) $4x^3$ (d) $4x^2$

26 If: $3a = 5b = 4c$, then a : b : c equals

- (a) 9 : 12 : 16 (b) 20 : 12 : 15 (c) 15 : 10 : 9 (d) 8 : 5 : 3



Q2: Answer The Following

1 Find the value of x if the numbers x, 24 and 144 are proportional.

$x = 4$

2 Find the number that if added to the numbers 3, 5, 9, and 13 it becomes proportional.

Number is 3

3 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, find the value of: $\frac{x - y + z}{2x + y}$.

$\frac{2}{5}$

4 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{4b + 7d}{4b + 7c} = \frac{5b - 8d}{5a - 8c}$$

Both sides = $\frac{1}{m}$

5 The mean proportional between the numbers 3 and 48 equals..... **12 or -12**



6 If b is the middle proportional between a and c, Prove that: $\frac{3a + 4b}{3b + 4c} = \frac{a}{b}$

Both sides = m

7 If $\frac{x - 2y}{x + 3y} = \frac{1}{3}$, Find the value of $\frac{y}{x}$

$\frac{2}{9}$

8 If 4, a, $\frac{1}{9b^2}$ are in continued proportion. Find the value of ab

$\pm \frac{2}{3}$

9 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{a + b}{b} = \frac{c + d}{d}$$

Both sides = m + 1

10 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, and $x + y - 2z = 12$ Find the value of z

$z = -15$





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

$$c^2 = a^2 + b^2$$

11 If b is the middle proportional between a and c, Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

Both sides = m^2

12 Find the value of x, y if the quantities 2, x, y and 54 are in a continued proportion.

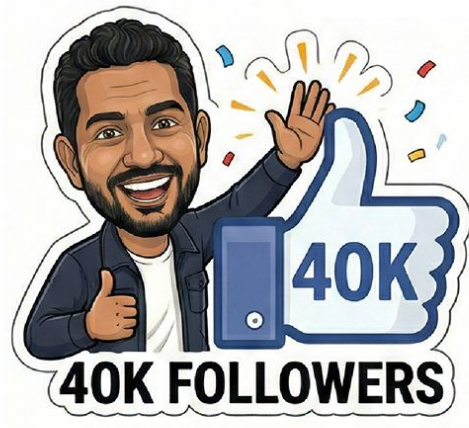
x = 6 and y = 18.

13 Find the number that if added to the two terms of the ratio 7 : 11 it becomes 2 : 3

The number is 1

14 If $\frac{a+b}{b} = \frac{c+d}{d} = \frac{c+d}{d}$, Find the value of $\frac{x+y+z}{x-y}$

12



Follow for More!



Q1: Choose the correct answer

1 If $(a + 5, 3) = (8, b - 1)$ then $\sqrt{a^2 + b^2}$

a 7

b 3

c 9

d 5

2 If $n(X^2) = 9$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

a 2

b 3

c 4

d 8

3 If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

a 3

b ± 3

c 9

d ± 9

4 If $n(X) = 2$ and $Y = \{1, 2\}$, then $n(X \times Y) = \dots\dots\dots$

a 4

b 3

c 5

d 6

5 If $(3, 5) \in \{(3, x), (3, 8), (6, 8)\}$, then $X = \dots\dots\dots$

a 8

b 3

c 5

d 6

6 If $X = \{1, 2\}$ and $Y = \{3, 4\}$, then $(3, 4) \in \dots\dots\dots$

a $X \times Y$

b $Y \times X$

c X^2

d Y^2

7 If $X = \{2\}$ and $Y = \{3\}$, then $X \times Y = \dots\dots\dots$

a 6

b $\{6\}$

c $(2, 3)$

d $\{(2, 3)\}$

8 If $X = \{3, 4\}$, then $n(X \times \emptyset) = \dots\dots\dots$

a 0

b 1

c 2

d \emptyset

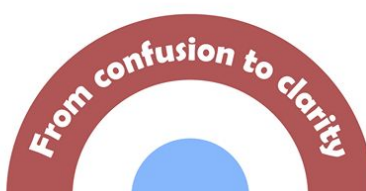
9 If $n(X \times Y) = 6$ and $Y = \{2\}$, then $n(X^2) = \dots\dots\dots$

a 4

b 9

c 16

d 36



9 If the point $(a, 5) \in Y$ -axis, then $a = \dots\dots\dots$

- (a) 0 (b) 5 (c) -5 (d) 25

10 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

- (a) 1 (b) -1 (c) ± 1 (d) 0

11 If the point $(3, b - 5)$ lies on the x-axis, then $2b + 1 = \dots\dots\dots$

- (a) Zero (b) 5 (c) 11 (d) 8

12 What is the S.S. for the inequality: $3 \geq x > -3$ in R?

- (a) $] -3, 3[$ (b) $] -3, 3]$ (c) $[-3, 3[$ (d) $[-3, 3]$

13 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to?

- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$

14 If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- (a) 8 (b) 9 (c) 11 (d) 12

15 If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where:
 $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k?

- (a) 5 (b) 7 (c) 8 (d) 9

16 If $(k^2 - 4, k)$ lies on the negative direction of Y-axis, then $k = \dots\dots\dots$

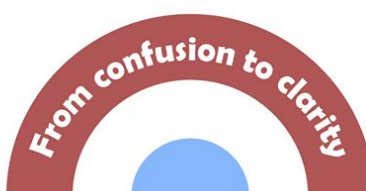
- (a) 2 (b) ± 2 (c) -2 (d) 0

17 If $f(x + 3) = x - 3$, then $f(7) = \dots\dots\dots$

- (a) 4 (b) 1 (c) 7 (d) 10

18 If $f(x) = 3$, then $f(-5) - f(5) = \dots\dots\dots$

- (a) 6 (b) 1 (c) zero (d) -1



19 What is the S.S. for the inequality: $5x \leq 25$ in \mathbb{R} ?

- (a) $]-\infty, 5[$ (b) $]5, \infty[$ (c) $[5, \infty[$ (d) $]-\infty, 5]$

20 If $f(x) = 4$, then $f(4) \div f(10) = \dots\dots\dots$

- (a) 4 (b) $\frac{2}{5}$ (c) 1 (d) 10

21 If $R = \{(1,3), (2,5), (4,3)\}$ represent a function, then its domain =

- (a) {1, 2, 4} (b) {3, 5, 4} (c) \mathbb{Z} (d) \mathbb{N}

22 If $f(x) = kx + 8$ and $f(2) = 0$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) -4

23 $f(x) = 3x$ is represented by a straight line passes through the point

- (a) (3, 3) (b) (3, 0) (c) (0, 0) (d) (0, 3)

24 If $f(x) = 5$, then $f(-3) = \dots\dots\dots$

- (a) 5 (b) -5 (c) -3 (d) -15

25 If $(a, 3)$ lies on the straight line that represents $f(x) = 2x - 5$, then $a = \dots\dots\dots$

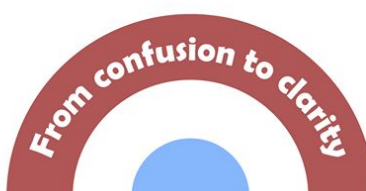
- (a) 2 (b) 1 (c) -2 (d) 4

26 If $f(x) = 3x + b$ and $f(4) = 13$, then $b = \dots\dots\dots$

- (a) 1 (b) 2 (c) 0 (d) 3

27 If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- (a) 3 (b) 4 (c) 5 (d) 6



28 If $f(x) = x^2$, $g(x) = x + 4$, what is the value of $5f(2) + 2g(5)$?

- (a) 18 (b) 20 (c) 38 (d) 70

29 If $(a, a) \in f$ where $f(x) = 2x + 3$, then $a = \dots\dots\dots$

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

30 If R is a relation where $R = \{(1, 7), (2, 8), (3, 7), (5, 8)\}$, Then the range = $\dots\dots\dots$

- (a) {1, 2, 3, 5} (b) {7, 8, 5} (c) {7, 8} (d) {1, 2, 7, 8}

31 If $(x, 7)$ is located on Y-axis, then $5x + 1 = \dots\dots\dots$

- (a) 0 (b) 1 (c) 5 (d) 6

32 The ordered pair $(1, 2)$ belongs to the function f where: $\dots\dots\dots$

- (a) $f(x) = 2x - 1$ (b) $f(x) = -3x + 7$ (c) $f(x) = 2x + 1$ (d) $f(x) = -3x + 5$

33 The straight line representing the function f where $f(x) = 3x - 12$ cuts the x-axis at the point:

- (a) $(-12, 0)$ (b) $(12, 0)$ (c) $(4, 0)$ (d) $(-4, 0)$

34 What is the solution set of the inequality $-x > 3$ in R ?

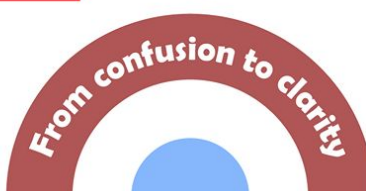
- (a) $]-\infty, -3[$ (b) $]-\infty, 3[$ (c) $]-3, \infty[$ (d) $]3, \infty[$

35 If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

- (a) -7 (b) -1 (c) 1 (d) 7

36 The interval $[-1, 2[$ is the solution set in R for the inequality: $\dots\dots\dots$

- (a) $-1 < x < 2$ (b) $-1 < x \leq 2$ (c) $-1 \leq x < 2$ (d) $-1 \leq x \leq 2$



37 If the straight line that represents the function $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

(a) -3

(b) 2

(c) 0

(d) 3

38 What is the solution set of the inequality $5 > -x > -3$ in R ?

(a) $[-5, 3]$

(b) $] -5, 3 [$

(c) $[-3, 5]$

(d) $] -3, 5 [$

Q2: Answer The Following

1 If $X = \{1, 3, 7\}$, $Y = \{5, 9\}$, find $X \times Y$, Y^2

$X \times Y = \{(1, 5), (1, 9), (3, 5), (3, 9), (7, 5), (7, 9)\}$

$Y^2 = \{(5, 5), (5, 9), (9, 5), (9, 9)\}$

2 Find the solution set for each of the following inequalities in R :

(a) $2x + 3 < 6$

$] -\infty, \frac{3}{2} [$

(b) $5 - 3x \geq 2$

$] -\infty, 1 [$

(c) $11 > 3x + 2 > -4$

$] -2, 3 [$

(d) $-8 \leq 4 - 3(x + 1) < 10$

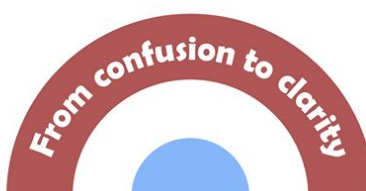
$] -3, 3 [$

3 Represent graphically the function f where $f(x) = 3x - 1$

If $x = 0$, $f(0) = 3(0) - 1 = -1$. Plot point: $(0, -1)$

If $x = 1$, $f(1) = 3(1) - 1 = 2$. Plot point: $(1, 2)$

If $x = 2$, $f(2) = 3(2) - 1 = 5$. Plot point: $(2, 5)$



4 If $X = \{0, 1, 2, 3\}$, $Y = \{6, 7, 8, 9, 10\}$ and R is a relation from X to Y where " xRy " means " $x+y = 10$ " for every $x \in X, y \in Y$ write the relation as a set of ordered pairs, then represent the relation with an arrow diagram stating the domain and the range of the relation. Does the relation represent a function or not? why?

$R = \{(0, 10), (1, 9), (2, 8), (3, 7)\}$

Domain: $\{0, 1, 2, 3\}$

Range: $\{7, 8, 9, 10\}$ Function check: Yes, the relation represents a function because every element in the domain X appears exactly once as a first coordinate.

5 If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k

$k = 4$

6 If $f(x) = 2x^2 - 5x + 2$, prove that $f(2) = f(\frac{1}{2})$

$f(2) = 0$ and $f(\frac{1}{2}) = 0$

7 If the straight line which represents the function $f(x) = ax + b$ intersects X -axis at $(3, 0)$ and Y -axis at $(0, -3)$, find the value of a and b

$a = 1$ and $b = -3$.

8 If $X \times Y = \{(2, 3), (2, 6), (2, 7)\}$, Find:

a) X and Y .

b) Y^2

c) $n(X^2)$

$X = \{2\}$

$Y = \{3, 6, 7\}$

$Y^2 = \{(3, 3), (3, 6), (3, 7), (6, 3), (6, 6), (6, 7), (7, 3), (7, 6), (7, 7)\}$

1



9 If $X = \{1, 3, 5\}$ and R is a function on X , and relation R is $\{(a, 3), (b, 1), (1, 5)\}$. Find:

- a) The range of the function **Range = {3, 1, 5}**
- b) The numerical value of the expression: $a + b$ **8**

10 Find the solution set of the inequality: $-3 < 2x + 5 < 13$ in R .

Solution set =]-4, 4[

11 If $X = \{1, 2\}$, $Y = \{2, 3, 4\}$, find:

- a) $(X \cap Y) \times X$ **{(2, 1), (2, 2)}**
- b) $(X - Y) \times Y$ **{(1, 2), (1, 3), (1, 4)}**
- c) $n(X^2)$ **4**

12 If $X = \{2, 1, 0, -1, -2\}$, and R is a relation on X , where aRb means (a is the additive inverse of b) for every $a, b \in X$.

Write the relation R and represent it with a Cartesian diagram.

$R = \{(2, -2), (1, -1), (0, 0), (-1, 1), (-2, 2)\}$

13 If the straight line for the function $f : R \rightarrow R$ where $f(x) = 6x - a$ cuts Y-axis at the point $(b, 3)$. Find the value of $2a + 7b$.

-6



14) If $(x + 3, 8) = (5, 2y)$, then find the value of x and y .

$x = 2$

$y = 4$

15) If $x = \{1, 3, 4, 5\}$, $y = \{1, 2, 3, 4, 5, 6\}$ and R is a relation from X to Y where " aRb " means " $a + b = 7$ " for each $a \in X, b \in Y$

- a) Write R and represent it with an arrow diagram.
- b) Show if R is a function or not, and why? If it is a function, find its range.

$R = \{(1, 6), (3, 4), (4, 3), (5, 2)\}$

Yes, R is a function. This is because every element in the domain X appears exactly once as the first projection (x -coordinate) in the relation.

Range = $\{6, 4, 3, 2\}$

16) If R is a relation from X to Y and $R = \{(2, 2), (0, 2), (3, 1), (4, 2)\}$

- a) Write the relation in a table form. **by yourself**
- b) Represent the relation graphically. $(2, 2), (0, 2), (3, 1),$ and $(4, 2)$.
- c) Find the domain and the range of the relation $\{2, 1\}$





From confusion to clarity



لمشاهدة فيديو الحل



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