

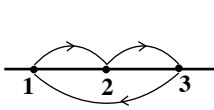
(1) Cairo

1 Complete each of the following:

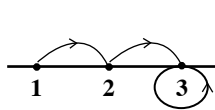
- a) If $\frac{a}{2} = \frac{b}{3} = 5$, then $a + b = \dots\dots\dots$.
- b) The range of the values 2, 9, 6, 16, and 8 is $\dots\dots\dots$.
- c) If 4, 6, and x are in proportion, then $x = \dots\dots\dots$.
- d) The point (1 , -1) lies on $\dots\dots\dots$ Quadrant.
- e) The positive square root of the average of squares deviations of values from the mean is called $\dots\dots\dots$.
- f) If $\frac{a}{\sqrt{3} - \sqrt{2}} = \frac{b}{\sqrt{3} - \sqrt{2}} = 1$, then $a b = \dots\dots\dots$.

2 Choose the correct answer:

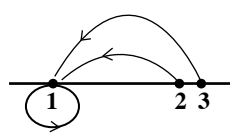
- a) If $X \times Y = \{(1, 3) , (1, 4)\}$ then $n(X) = \dots\dots\dots$. (1 , 2 , 3 , 4)
- b) In the opposite figures, if R is a function on $X = \{1, 2, 3\}$ of range $= \{1\}$, then the graph that represent it is $\dots\dots\dots$



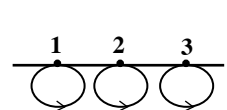
a)



b)



c)



d)

- c) If $f(x) = 4x + b$, $f(3) = 15$ then $b = \dots\dots\dots$. (156 , 3 , 4 , -3)
- d) If $\frac{y}{x} = 5$, then $y \propto \dots\dots\dots$. (x , $\frac{1}{x}$, x^5 , $\frac{1}{x^5}$)
- e) If $\frac{a}{b} = \frac{c}{d} = \frac{3}{4}$, then $\frac{a+c}{b+d} = \dots\dots\dots$. ($\frac{3}{4}$, $\frac{7}{4}$, $\frac{3}{7}$, $\frac{9}{16}$)
- f) Which of the following relations represents an inverse variation between the two variables x and y ? ($y = \frac{x}{7}$, $xy = 7$, $y = 7x$, $\frac{y}{x} = \frac{7}{2}$)

- 3 a) If $x = \{1 , 2 , 3\}$, $y = \{1 , 3 , 6 , 9 , 12\}$ and R is a relation from x to y where $a R b$ means " $a = \frac{1}{3} b$ " for all $a \in x$, $b \in y$. Write R and prove that R is a function and write its range.

- b) If $y \propto x$, $y = 6$ when $x = 3$, then find the relation between x and y .

- 4 a) Draw the function f where $f(x) = x(6 - x) + 4$, $x \in [-1 , 7]$

- b) If b is the middle proportional between a and c , then prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

5 a) If $\frac{a}{2} = \frac{b}{5} = \frac{2a+b}{3x}$, then find the value of x.

b) Calculate the mean of the values : 2, 3, 6, 8, and 11 , then deduce their standard deviation.

(2) Giza

1 Complete the following:

a) If $n(X) = 5$, $n(X \times Y) = 15$ then $n(Y) = \dots\dots\dots$.

b) If $a = \sqrt{3}$, $b = \sqrt{2}$ then the value of $a^4 - b^4 = \dots\dots\dots$.

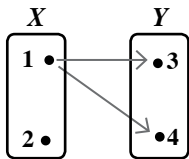
c) If $F : R \rightarrow R$, $f(x) = 3x$ represented by a straight line passing through $(-4, \dots)$

d) If $X = \{2, 3\}$ then $X^2 = \dots\dots\dots$. e) If $y = 3x$ then $y \propto \dots\dots\dots$.

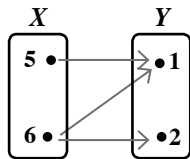
f) The range for the set 12 , 15 , 19 , 25 and 30 equals $\dots\dots\dots$.

2 Choose the correct answer:

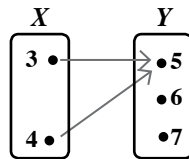
1) The diagram that represents a function is $\dots\dots\dots$.



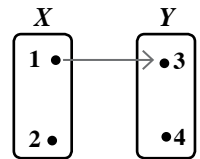
(a)



(b)



(c)



(d)

2) If $f(x) = x^3$, then $f(2) + f(-2) = \dots\dots\dots$.

a) 0

b) 2

c) 3

d) 8

3) The middle proportion between the two numbers 4 and 36 = $\dots\dots\dots$.

a) 32

b) 40

c) 12

d) ± 12

4) If $\frac{x}{3} = \frac{8}{12}$ then $x = \dots\dots\dots$.

a) 6

b) 5

c) 4

d) 2

5) The mean for the values 3, 4, 6 and 7 equals $\dots\dots\dots$.

a) 5

b) 10

c) 20

d) 40

6) If $\frac{x}{y} = \frac{2}{3}$ then $\frac{3x}{5y} = \dots\dots\dots$.

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

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

c) $\frac{3}{5}$

d) $\frac{5}{8}$

3 a) If $x = \{2, 3, 4, 7\}$, $y = \{1, 2, 3, 4, 7, 8\}$ and R is a relation from x to y where $a R b$ means that “a - b is a prime number” for all $a \in X, b \in Y$. Write R, represent it by an arrow diagram.

b) If $y \propto \frac{1}{x}$ and $y = 3$ when $x = 2$

Find: 1) The relation between x and y 2) The value of y when $x = 1.5$

4 a) Find the number that if subtracted thrice from the two terms of ratio $\frac{49}{69}$ the ratio becomes $\frac{2}{3}$.

b) Draw the function $f(x) = 4 - x^2$ where $x \in [-3, 3]$ then find:

i) max. point of $f(x)$ ii) equation of axis of symmetry.

5 a) If a, b, c and d are proportional. **Prove that:** $\frac{a-b}{b} = \frac{c-d}{d}$

b) The following frequency distribution shows the marks of 40 students in an exam:

Sets	0 –	4 –	8 –	12 –	16 - 20	Total
Frequency	2	5	8	15	10	40

Find: The standard deviation for this distribution.

(3) Alexandria

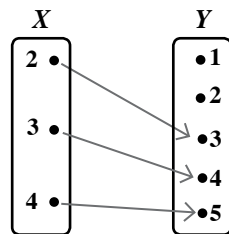
1 Choose the correct answer:

a) The middle proportional between 3, 27 is (–9 or 9 or ± 9 or 21)

b) **In the opposite function:**

Represents a function from $X \rightarrow Y$, then its range is

({2, 3, 4} or {2, 3, 5} or {3, 4, 5} or Y)



c) If y varies inversely with x and $x = \sqrt{3}$ when $y = \frac{2}{\sqrt{3}}$ then the constant of proportion equals ($\frac{1}{2}$ or $\frac{2}{3}$ or 2 or 6)

d) The most repeated value in a set of values represents is

(median or rang or mode or mean)

e) If $f(x) = 5x + 4$ represented by a straight line passing through (3, b) then $b = \dots\dots\dots$ (5 or 4 or 3 or 9)

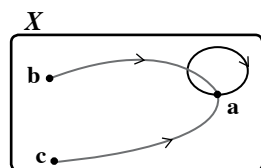
f) If $2a = 3b$ then $\frac{5b}{a} = \dots\dots\dots$ ($\frac{5}{3}$ or $\frac{5}{2}$ or $\frac{15}{2}$ or $\frac{10}{3}$)

2 Complete:

a) **In the opposite figure:**

Represents a function on X , its range =

- 1) {a} 2) {a, b, c}
3) {a, b} 4) {b, c}



- b) The range for the values 7, 4, 9, 5 and 13 is
- c) The function f where $f(x) = -3$, intersects Y-axis in the point (.....,
- d) If $\frac{a}{b} = \frac{3}{2}$ then $\frac{a+b}{a-b} = \dots\dots\dots$
- e) The relation between the distance and time at uniform velocity is called variation.
- f) If $(x+5, 8) = (1, 64+x)$ then $y = \dots\dots\dots$
- 3** a) If the straight line which represents $F: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 6x - a$ cut y-axis at $(b, 3)$ find a, b
- b) If b is a middle proportional of a and c prove that $\frac{a^3 + b^3}{b^3 + c^3} = \frac{a^2}{bc}$
- 4** a) Find the number which if added to the two terms of ratio 7 : 11 it will be 2:3
- b) If $x = \{0, 1, 2, 3, 4, 5, 6\}$, R is a relation on x such that $a R b$ means “a twice b” for all $a, b \in x, a \neq b$.
- 5** a) If $x = L + 9$ and $L \propto y$ then find the relation between x and y know that $x = 24$, when $y = 5$, then find the value of y when $x = 12$.
- b) Calculate the standard deviation for the values : 12, 13, 16, 18, 21.

(4) Al Menofia

1 Choose the correct answer:

- a) If $n(x^2) = 9$ then $n(x) = \dots\dots\dots$ (1, 2, 3, 4)
- b) The range of values 1, 5, 12, 10, 9 and 5 is (5 or 7 or 10 or 11)
- c) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$ then the value of $a = \dots\dots\dots$
(5×2^2 or 40 or 10 or 2×5^3)
- d) If $yx^2 = 5$ then y changes inversely with = ($\frac{1}{x^2}$ or $\frac{1}{x}$ or x or x^2)
- e) If $f(x) = 6x$, then $f(2) + f(-2) = \dots\dots\dots$ (0, 1, 12, 24)
- f) If $5a, 2, 3b$ and 7 are proportional quantities when $\frac{a}{b} = \dots\dots\dots$
($\frac{3}{7}$ or $\frac{6}{35}$ or $\frac{3}{5}$ or $\frac{3}{2}$)

2 Complete the following:

- a) If the standard deviation of a set of values equal zero then
- b) If $f(x) = 5x - 7$ then $f(3) = \dots\dots\dots$
- c) If $y \propto x$ and $y = 8$ when $x = 2$ so $y = \dots\dots\dots$ when $x = 3$

d) If $x \in \mathbb{R}^+$ and $(x^2 + 3)(x + \sqrt{3})(x - \sqrt{3}) = 7$ then $x = \dots\dots\dots$

e) If $\frac{x}{y} = \frac{3}{5}$ then $\frac{5x}{3y} = \dots\dots\dots$

f) If $(5, x-7) = (y+1, -5)$. Then $x + y = \dots\dots\dots$

3 a) If a, b, c and d are proportional quantities, **Prove that:** $\frac{d}{c+d} = \frac{b}{a+b}$

b) Graph $f(x) = -x^2 + 1, x \in [-3, 3]$

4 a) If $y \propto \frac{1}{x}, y = 6$ at $x = 3$

1) **Find:** the relation between x, y

2) **Find:** y at $x = 2$

b) IF $x = \{1, 3, 5\}$ and R is a function on x where $R = \{a, 3\}, (b, 1), (1, 5)\}$ then find $a + b$. **Find** the value of : $\frac{x^3 - y^3}{x - y}$

5 a) If b is a middle proportional between a and c .

Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

b) The following frequency distribution shows the number of goals scored in 30 matches.

Number of goals	zero	1	2	3	4	5
Number of matches	1	4	5	9	6	5

Find the mean and the standard deviation for the number of goals.

(5) Al Gharbia

1 Complete the following:

a) The point $(-1, 1)$ lies on the quadrant.

b) If $n(X) = 3, n(X \times Y) = 12$, then $n(Y) = \dots\dots\dots$

c) If $ad = bc$ then $\frac{a}{c} = \dots\dots\dots$

d) The middle proportional between 4 and 9 =

e) The range for the values 7, 4, 9, 5, 13 is

f) If $xy = -5$ then $y \propto \dots\dots\dots$

2 Choose the correct answer from those between brackets:

a) If $x \times y = \{(1, 3), (1, 4)\}$ then $n(x) = \dots\dots\dots$ (1, 2, 3, 4)

b) If $X = \{3, 4\}, Y = \{5, 6, 2\}$, then $(6, 4) \in \dots\dots\dots (X \times Y, Y \times X, X^2, Y^2)$

c) The fourth proportional for the numbers 2, 6, 9 is

(12 or 18 or 27 or 54)

- d) If $y \propto x$ and $y = 6$ at $x = 2$ then $y = \dots\dots\dots$ when $x = 3$.
 (6 or 9 or 12 or 18)
- e) The mean for 30 , 20 , 50 , 60 is (25 or 40 or 50 or 55)
- f) If $\frac{a}{b} = \frac{3}{2}$ then $\frac{a-b}{a+b} = 2$ then the value of $a = \dots\dots\dots$.
 ($\frac{3}{2}$ or 5 or $\frac{1}{5}$ or $\frac{2}{3}$)

- 3** a) Two integer numbers, the ratio between them is 3:7 and if subtracted 5 from each term, the ratio between each of them becomes 1:3. Find the two numbers.
- b) If $x = \{2, 4, 8\}$, $y = \{4, 6, 12, 24\}$ and R is a relation from x to y . Where aRb means $b > 2a$ for all $a \in x, b \in y$ write R , represent it by an arrow diagram, Cartesian diagram.
- 4** a) If a, b, c and d are four proportional quantities. Prove that $\frac{ac}{bd} = \left(\frac{a-c}{b-d}\right)^2$
- b) If $y \propto \frac{1}{x}$ and $y = 2$ when $x = 4$.
Find: 1) The relation between x and y . 2) The value of y when $x = 16$.
- 5** a) Draw the function $f(x) = 2 - x^2$ where $x \in [-3, 3]$ then find:
 i) max. point of f ii) equation of the axis of symmetry.
- b) Calculate the standard deviation for the values: 6 , 7 , 8 , 9 and 10.

(6) Al Dakahlia

1 Complete the following:

- a) If $Y \propto X$ and $Y = 6$ when $X = 4$ then $\frac{Y}{X} = \dots\dots\dots$.
- b) The linear function $y = 2x - 1$ represented by a straight line cut y-axis at
- c) The arithmetic mean of the values 4 , 13 , 18 , 25 , 30 is
- d) If $\frac{a}{b} = \frac{7}{4}$ then $\frac{4a}{b} = \dots\dots\dots$.
- e) One third the number 3^{18} in the form a^n is
- f) If 1 , x , 9 , y are in continued proportion then $x = \dots\dots\dots$, $y = \dots\dots\dots$, where x, y are + ve.

2 Choose the correct answer:

- 1) Biggest value - smallest value for a given data is
 a) Median b) Range c) Mode d) Standard deviation
- 2) If $\frac{a}{5} = \frac{b}{2} = \frac{a-2b}{k}$ then $k = \dots\dots\dots$.
 a) 5 b) 2 c) 3 d) 1

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

- a) 3 b) 6 c) 18 d) 81

4) If $1 + 4x^2y^2 = 4 \times y$ then $\dots\dots\dots$

- a) $y \propto \sqrt{x}$ b) $y \propto \frac{1}{x}$ c) $y \propto x$ d) $y \propto \frac{1}{x^2}$

5) The value of x which satisfies the equation $2^x + 2^{x+1} = \frac{2}{3}$ is $\dots\dots\dots$

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

6) If the function $f(x) = 6$, then $\frac{f(3)}{f(a)} = \dots\dots\dots$

3 a) If $\frac{x+y}{5} = \frac{y+z}{3} = \frac{x+z}{6}$ prove that: $\frac{x-z}{2} = \frac{x+y+z}{7}$

b) If $x = z + 8$ and $z \propto \frac{1}{y}$ and it $z = 2$ when $y = 3$, Find y at $x = 3$

4 a) If $x = \{0, 1, 2, 3, 4, 5, 6\}$, $y = R$ is a relation on x such that $a R b$ means "a twice b" all $a, b \in x$, $a \neq b$.

i) Write R , represent it by an arrow diagram.

ii) Is $(0,0) \in R$?

iii) Is $2 R 4$?

iiii) find x if $6 R x$

b) If a, b, c, d are in continued proportion **prove that:** $\frac{ab - dc}{b^2 - c^2} = \frac{a + c}{b}$

5 a) Draw the function $f(x) = x(6 - x) + 4$ on the interval $[-1, -7]$

b) The following table shows the number of goals scored in football matches.

Number of goals	zero	1	2	3	4	5	6
Number of matches	1	4	6	9	5	3	2

calculate the standard deviation of number of goals.

(7) Behera

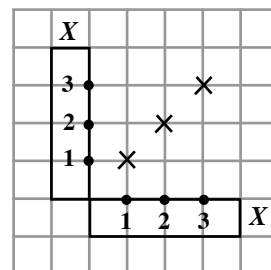
1 Choose the correct answer:

1) In the opposite figure:

The Cartesian diagram of a function on X ,

then its range = $\dots\dots\dots$

- a) $\{1, 2, 3\}$ b) $\{2, 1\}$
c) X d) $\{3\}$



2) The function $y = x + 3$ represented by a straight line cut x -axis at $\dots\dots\dots$

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

- 3) If $x = \{5\}$, $y = \{3\}$ then $n(x \times y) = \dots\dots\dots$.
 a) 15 b) 8 c) 2 d) 1
- 4) The fourth proportional for the numbers 8 ,6 and 4 is
 a) 2 b) 3 c) 4 d) 7
- 5) The range for the values 7, 4, 9, 5 and 13 is
 a) 6 b) 7 c) 9 d) 5
- 6) If $\frac{a}{b} = \frac{5}{4}$ then $\frac{a+b}{a-b} = \dots\dots\dots$.
 a) $\frac{5}{4}$ b) 9 c) $\frac{4}{5}$ d) 2

2 Complete the following:

- a) If $f(x) = 3x + b$, $f(4) = 13$ then $b = \dots\dots\dots$.
- b) If $x + \frac{1}{x} = 2$ where $x \neq 0$, then $x^2 + \frac{1}{x^2} = \dots\dots\dots$.
- c) The quantities a , b and c are said to be in continued proportional if $\frac{a}{b} = \dots\dots\dots$
- d) If $y \propto x$ and $y = 6$ at $x = 2$ then $y = \dots\dots\dots$ when $x = 12$
- e) The positive square root to the average of squares deviations of values from the mean is called
- f) The proportion is the equality of

- 3** a) If $x = \{1 , 2 , 4\}$ and R is relation on x where $a R b$ means “ a is a multiple of b ” for all $a, b \in x$. Write R , represent it by an arrow diagram. Is R a function.
- b) If b is a middle proportional between a and c

Prove that:
$$\frac{a^3 + b^3}{b^3 + c^3} = \frac{a^2}{bc}$$

- 4** a) If $\frac{x}{y} = \frac{3}{5}$ = find the value of the ratio: $\frac{3x - y}{5y - 2x}$
- b) If $Y \propto \frac{1}{X}$ and $Y = 5$ when $X = 15$

First: Find the relation between X and Y

Second: Find the value of X when $Y = 10$

- 5** a) If 5, 6, 7, 8 and 9 represent the marks of a pupil in mathematics test in 5 months. **Find** the mean and the standard deviation.
- b) Draw the function $f(x) = 1 - x^2$ where $x \in [-3 , 3]$ then find:
 i) max. point of $f(x)$ ii) equation of the axis of symmetry.

(8) Damietta

① Choose the correct answer from the given answers:

1. If $f(x) = 2x$ represented by a straight line passing through $(-3, \dots)$
 a) -6 b) -5 c) -3 d) 2
2. The point $(-2, 1)$ lies on the quadrant
 a) 1^{st} b) 2^{nd} c) 3^{rd} d) 4^{th}
3. The point $(3, 0)$ lies on axis
 a) 0 b) 1 c) 2 d) 3
4. If $x + \frac{1}{x} = 2$ then $x^2 + \frac{1}{x^2} = \dots$
 a) 4 b) 2 c) zero d) 5
5. If $\sum (x - \bar{x})^2 = 144$ for set of values whose number is 9 then $\sigma = \dots$
 a) 16 b) 4 c) 12 d) 9
6. If $x : y = 3 : 2$, $y : z = 4 : 5$ then $x : y : z = \dots$
 a) $2 : 4 : 5$ b) $6 : 4 : 5$ c) $4 : 6 : 5$ d) $10 : 12 : 15$

② Complete to make the following statements correct:

- a) The proportion is
- b) The most accurate measure of the dispersions is
- c) The middle proportional between the two numbers $4, 9$ equals
- d) If $3a - 2b = \text{zero}$ then $\frac{a}{b} = \dots$
- e) If $f(x) = x^2 + 7$ then $f(3) = \dots$
- f) If $y \propto \frac{1}{x}$ and $y = 3$ when $x = 20$ then $x = 12$ when $y = \dots$

- ③ a) If $x = \{2, 4, 8\}$, $y = \{4, 6, 12, 24\}$ and R is a relation from x to y where aRb means $b > 2a$ for all $a \in x, b \in y$ write R , represent it by an arrow diagram, Cartesian diagram.

Then find the value of the result when $x = 1$.

- b) If $2a = 5b$ find the value of: $\frac{8a^2 - ab}{4ab + 5b^2}$

- ④ a) Draw the function $f(x) = x^2 - 4$ where $x \in [-3, 3]$ then **find**:

- i) max. point. ii) equation of the axis of symmetry.
- b) If $y \propto x$ and $y = 14$ when $x = 42$ **Find**:
 1) The relation between y and x . 2) Value of y when $x = 20$

5 a) If $\frac{a}{4x+y} = \frac{b}{x-4y}$ prove that: $\frac{a+b}{5x-3y} = \frac{a-b}{3x+5y}$

b) The following table shows frequency distribution of the number of goals scored by 100 players in five penalties:.

Number of goals	zero	1	2	3	4	5	Total
Number of players	3	16	17	25	20	19	100

Calculate the mean and the standard deviation to the number of recorded goals.

(9) Port Said

1 Complete the following:

a) From the data of the following table:

X	3	5	6	10
Y	10	6	5	3

The kind of variation between y and x is

b) The point (0 , 4) lies on axis.

c) If the mean of the values: 10, x, 18 , 12 equal 15 then x =

d) If $y \propto x$ then $y = \dots\dots\dots$

e) Resources of collecting data are,

f) The middle proportional between 2 , 18 , is

2 Choose the correct answer:

1) If $xy = \{(1,3) , (1,4)\}$ then $n(x) = \dots\dots\dots$

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

2) If $(2, b) \in f$ where $f(x) = 3x - 6$ then $b = \dots\dots\dots$

a) 0 b) 2 c) 7 d) 9

3) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a-b+c}{x}$ then $x = \dots\dots\dots$

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

4) If $a = \sqrt{5}$, $b = \sqrt{7}$ then $a^4 \times b^{-4} = \dots\dots\dots$

a) $\frac{7}{5}$ b) $\frac{5}{7}$ c) $\frac{25}{49}$ d) $\frac{49}{25}$

5) If $(x-5 , 7-x)$ lies on the 2nd quadrant then $x = \dots\dots\dots$

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

6) If $y \propto \sqrt{x}$ and $y = 5$ when $x = 9$ then $y = \dots\dots\dots$

a) 5x b) $\frac{5}{3}x$ c) 3x d) $\frac{3}{5}x$

- 3 a) Represent graphically the function $f(x) = (x-3)^2$ where $x \in [0, 6]$ and from the graph find the vertex point and max. and minimum point at the function.

b) If $\frac{a+b}{3} = \frac{2b+c}{6}$ = prove that : $c \propto a$

- 4 a) If $x = \{1, 2, 5, 7\}$, $y = \{2, 3, 7, 8\}$ and R is a relation from x to y where a $R b$ means “ $a+b$ is an odd number” for all $a \in x$, $b \in y$ write R and represent it by an arrow diagram.

- b) If a, b, c and d are four real proportional quantities. Then prove that:

$$\frac{ac}{bd} \left(\frac{a-c}{b-d} \right)^2$$

- 5 a) If y changes inversely with x and $y = 2$ when $x = 4$ then

Find the value of y when $x = 16$

- b) The following frequency distribution shows the ages of 20 children.

Ages in year	2	4	6	8	10	Total
Number of children	3	4	7	5	1	20

Calculate: The standard deviation to ages in years.

(10) Suez

1 A) Complete:

1. The point $(5, -3)$ lies on the quadrant.

2. If $x = \{5, 6, 7\}$ then $n(x^2) = \dots\dots\dots$

3. If $y \propto x^2$ then $\frac{y_1}{y_2} = \dots\dots\dots$

B) If $x = \{0, 1, 2, 3, 4, 5, 6\}$, R is a relation on x such that a $R b$ means “ a twice b ” for all $a, b \in x$, $a \neq b$, then $R = \dots\dots\dots$

2 A) Complete:

1. The middle proportion for the values 1 and 4 equals

2. The mean for the values 4, 3, 2, 5, 1 is

3. If $f(x) = 5x - 7$ then $f(3) = \dots\dots\dots$

B) If $\frac{x}{y} = \frac{2}{3}$ Find the value of the ratio $\frac{6x - 2y}{y - x}$.



3 (A) Choose the correct answer:

- If $f(x) = x^3$ then $f(2) + f(-2) = \dots\dots\dots$ (zero or $\frac{1}{2}$ or 1 or 2)
- The range for the values 2 , 13 , 12 , 16 and 14 is $\dots\dots\dots$ (2 or 13 or 14 or 16)
- If $(2, -6) \in f$ where $f(x) = kx$, then $k = \dots\dots\dots$ (-1 or -2 or -3 or 3)

B) Represent graphically $f(x) = 2 - x$

4 (A) Choose the correct answer from the given answers:

- If $f(x) = 5x - 7$ then $f(3) = \dots\dots\dots$ (1, 5 , 7 , 8)
- If $\frac{A}{B} = \frac{3}{4}$ then $4A - 3B + 5 = \dots\dots\dots$ (0 or 1 or 3 or 5)
- If $y = \frac{-3}{x}$ then $\dots\dots\dots$ ($y = x$ or $y \propto x$ or $y \propto \frac{1}{x}$ or $yx = 0$)
- If a, b, c and d is continued proportional. **Prove that** $\frac{a+c}{b+d} = \frac{b}{c}$

5 a) If $Y \propto \frac{1}{X}$ and $Y = 1$ when $X = 2$.

Find: 1) The relation between X and Y . 2) The value of X when $Y = 4$.

b) The following distribution for the marks of some students in one of the exams:

Marks	0	1	2	3
Number of students	1	2	3	4

Find: 1) The mean. 2) The standard deviation for the marks of the students.

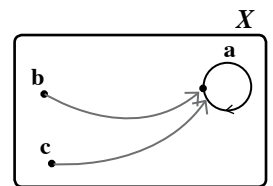
(11) Al Fayoum

1 Choose the correct answer between brackets:

a) In the opposite figure:

The range of the function = $\dots\dots\dots$

- $\{a\}$
- $\{a, b\}$
- $\{a, b, c\}$
- $\{b, c\}$



- The point $(7, -9)$ lies on the $\dots\dots\dots$ quadrant. (1^{st} , 2^{nd} , 3^{rd} , 4^{th})
- If $f(x) = x^7 - 3x^2$, then its degree = $\dots\dots\dots$

d) The positive middle proportional between the two numbers 2 , 8 equals $\dots\dots\dots$ (6 or 4 or -4 or 16)

e) If $\frac{x}{5} = \frac{y}{7}$ then the expression $7x - 5y + 9 = \dots\dots\dots$ (4 or 7 or 9 or $\frac{5}{7}$)

- f) From the secondary resources to collect data is the
(interview or questionnaires or personnel database or observation and measurement)

2 Complete each of the following to get correct statements:

- a) The difference between the greatest value and the smallest value the set is called
b) The fourth proportional of the numbers 4 , 3 , 8 is
c) If $\frac{5a - 7b}{8a + 11b} = \text{zero}$ then $\frac{b}{a} = \dots\dots\dots$.
d) If $y \propto x$ and $y = 2$ when $x = 8$ then $y = \dots\dots\dots$ when $x = 12$.
e) The point (3 , 0) lies on axis.
f) If $f(x) = ax + b$, $f(y) = 13$ then $b = \dots\dots\dots$.

3 a) Graph $f(x) = x^2 - 6x + 9$, $x \in [0, 6]$.

- b) If $\frac{x+y}{7} = \frac{x+z}{5} = \frac{z+x}{8}$ Prove that $\frac{x+y+z}{x-z} = 5$

4 a) If b is a middle proportional between a , c Prove that: $\frac{c}{a} = \frac{c^2}{b^2}$

- b) If $y \propto \frac{1}{x}$ and $y = 3$ when $x = 2$ Find:

- 1) The relation between x , y . 2) The value of y when $x = 1\frac{1}{2}$

5 a) If $x = \{1, 3, 4, 5\}$, $y = \{1, 9, 3, 4, 5, 6\}$ and R is a relation from x to y where a R b means “a + b = 7” for every $a \in x$, $b \in y$ write R and represent it by an arrow diagram and Cartesian diagram. Is R a function? Why?

- b) The following is a frequency distribution which shows the number of children of some families in one of the new cities

Number of children	zero	1	2	3	4	Total
Number of families	5	7	7	5	6	30

Calculate the mean and the standard of the number of children

(12) Aswan

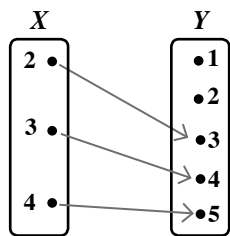
1 Choose the correct answer from the given ones:

- 1) The difference between the greatest value and the smallest value in the set called
a) median b) the range c) mode d) mean

2) In the opposite function:

Represents a function from $X \rightarrow Y$, then its range is

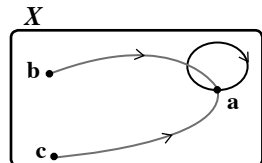
- a) $\{2, 3, 4\}$ b) $\{2, 3, 5\}$
c) $\{3, 4, 5\}$ d) Y



3) In the opposite figure:

Represents a function on X , its range =

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



4) Which relation represents the inverse variation between y and x

- a) $y = 5x + 1$ b) $y = \frac{1}{2}x$ c) $xy = 7$ d) $\frac{x}{y} = \frac{2}{3}$

5) The mean for the values 2, 5, 7 and 10 is

- a) 2 b) 8 c) 4 d) 6

2) Complete the following statements:

- 1) If $y = 2x$, then $y \propto$
- 2) If the function $f : f(x) = -2$, then $f(x + 2) =$
- 3) If $5a = 7b$, then $\frac{b}{a} =$
- 4) If 2, x , 4, 6 are proportional quantities, then $x =$
- 5) The value of the expression $2^{\text{zero}} + 2^{-1} - \left(\frac{-1}{\sqrt{2}}\right)^2 =$
- 6) If $\frac{a}{3} = \frac{b}{5} = \frac{a+b}{2x}$, then $x =$

3) a) Graph $f(x) = x^2 - 2x$, $x \in [-1, 3]$.

b) The point $(-1, -1)$ is located in the quadrant.

- a) first b) second c) third d) fourth

4) a) First

x	3	5	4
y	20	12	15

1) From the opposite table write the type of variation that data represents between y and x .

2) Write the relation between y and x .

b) Find x when $y = 40$

5 a) First: If $y \propto x$ and $y = 6$ when $x = 2$, find the value of y when $x = 5$

Second: Calculate the standard deviation of the following values 12, 14, 16 and 18.

b) Find the two numbers which the ratio between them equals $7 : 12$, and one of them is more than the other by 275.

(13) Kafr El-Sheikh

1 Choose the correct answer:

1) The middle proportional between $3b$, $12a^2b$ is ($-6a$, $\pm 6b$, $\pm 6ab$, ab)

2) If $\frac{a}{b} = \frac{2}{5}$, then $\frac{a-b}{a+b} = \dots\dots\dots$ ($\frac{3}{7}$, $-\frac{3}{7}$, $\frac{7}{3}$, $-\frac{7}{3}$)

3) The range of the set of values: 8, 3, 5, 12, 10 is (7, 8, 9, 10)

4) If the point $(3, a)$ lies on the X-axis then $a = \dots\dots\dots$
(-3 , 3 , zero, 2)

5) The fourth proportional of the numbers 2, 5, 8 is (20, 22, 25, 30)

6) If y varies inversely with \sqrt{x} and $y = 3$ when $x = 16$,

Then the constant of variation = ($\frac{4}{3}$, $\frac{3}{4}$, -12 , 12)

2 Complete:

1) If $f(x) = x^3 - (5 + x^3)$ of degree.

2) If a weight of a body on the earth (R) directly changes with its weight on the moon (W). If $R_1 = 182$ kg, $W_1 = 35$ kg, then find W_2 when $R_2 = 312$ kg.

3) If 15 workers need 16 days to finish a certain job. How many workers are needed to finish the same job in 12 days?

4) A car moves with a uniform velocity, where the covered distance varies directly with the time. If the car covers a distance 120 km in 5 hr. Find the distance covered by that car in 8 hr.

5) If Y varies directly as x and inversely as z , then $y \propto \dots\dots\dots$

6) $f(x) = x^2 - 10x + 25$, then $f(4) - f(6) = \dots\dots\dots$

7) If the mean of numbers: $3a - 3$, $3a - 1$, $2a + 1$, $2a + 3$, $2a - 6$ is 6 then $a = \dots\dots\dots$

8) If $x^2 - 4xy + 4y^2 = 0$, then $y \propto \dots\dots\dots$

3 If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4}$, find the value of $\frac{2a - b + 5c}{3b - a}$

4 a) If: $Y \propto \frac{1}{x}$, where $y = 2$ when $x = 3$

Find the relation between y and x , then find the value of y when $x = 12$

b) Graph $f(x) = -x^2$, $x \in [-2, 2]$

5 a) If the number of hours (y) is proportionally inverse with the number of workers (x), and 66 workers fulfilled the work in 4 hours. What is the time needed for 8 workers to fulfill this work?

b) **Find** the standard deviation (show steps)

Degree	5	8	9	10	12	Total
Frequency	1	2	3	3	1	10