

Name : Class :

(1) Complete the following:-

1) $12 : \dots\dots\dots = 4 : 5$

2) $x^2 : y = 4x^2y : \dots\dots\dots$

3) $\frac{a^2c}{b^2d} : \frac{ac^2}{d^2b} = \dots\dots\dots : bc$

4) The proportion is

5) If $\frac{a}{b} = \frac{5}{7}$ then $a = \dots\dots\dots$, $b = \dots\dots\dots$

6) If $\frac{x}{y} = \frac{Z}{L} = \frac{5}{4}$, then $\frac{x+z}{y+l} = \dots\dots\dots$

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

8) If a, b, c are proportional, then $b = \dots\dots\dots$

9) If $\frac{y}{x} = \frac{x}{z} = \frac{2}{5}$ then $y = \dots\dots\dots z$

10) The real numbers which make $(x+1), (x+5), (x+13)$ are proportional is

11) If $x, \sqrt{8}, 7, 14\sqrt{2}$ are four proportional quantities, then $x = \dots\dots\dots$

12) If $x : y = 3 : 1$, $x + y = 28$, then $x = \dots\dots\dots$, $y = \dots\dots\dots$

13) If $\frac{a}{b} = \frac{3}{5}, \frac{a}{c} = \frac{3}{7}$, then $\frac{c}{b} = \dots\dots\dots$

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

15) If $y \propto x^2$, then $y = \dots\dots\dots$

16) If y varies inversely as x then y varies directly as

17) If $y \propto x^2$ when z is constant of $y \propto \frac{1}{z}$ when x is constant, then $y \propto \dots\dots\dots$

18) If $a \propto \frac{1}{b}$, then $\frac{a1}{a2} = \dots\dots\dots$

19) The point of intersection of the two straight lines $y = -1$, $x - 2y = 1$ is

20) If $\frac{a+b}{a+2b} = \frac{2}{5}$ then $a : b = \dots\dots\dots$

21) If 10 is the middle proportion between 4 , x then x =

22) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{3} = 2$ then a =

23) If 4 , -10 , 5 x are proportional , then x =

24) If $2xy = 3$ then ($y \propto x$, $y \propto \frac{1}{x}$, $y = \frac{1}{x}$, $y = \frac{2}{3}x$)

25) If y varies inversely as (x + 4) , if y = 4 as x = 1 then the constant of the variation is

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(2)a) :-

If $\frac{x}{y} = \frac{2}{3}$, then find $\frac{x^2 + 2xy - y^2}{6xy}$

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b) Find the positive number which if we subtracted it's square from each of the two terms of the ratio $\frac{41}{91}$ the rest will be $\frac{1}{3}$

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(3)a):- $x^2 + 64y^2 = 16xy$, then find $\frac{2x+3y}{x-5y}$

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b) If $\frac{a}{2x+y} = \frac{b}{3y-x} = \frac{c}{4x+5y}$ then prove that $\frac{a+2b}{4b+c} = \frac{7}{17}$

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(4):- If $y \propto (x - 1)$, $y \propto \frac{1}{x}$ then find the relation between x & y if x = 3 and y = 2

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(5):- If $2a = 3b = 4c$, then find $a : b : c$

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(6):- If $x \times y = \{ (1,1), (1,3), (1,5) \}$ find:

- a) x, y b) $y \times x$ c) y^2

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(6):- If $x = \{ 3,4 \}$, $y = \{ 4,5 \}$ and $z = \{ 6,5 \}$, find:

- a) $x \times (y \cap z)$ b) $(x-y) \times z$ c) $(x-y) \times (y-z)$

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(8):- Graph the linear fraction $f(x) = 3x - 1$ then find the point of intersection of the straight line with the two axes.

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(9):- Represent graphically the function $f: f(x) = x^2 - 2$ taken $x \in [-3,3]$ and from the graph deduce the coordinates of point of vertex of curve, the equation of the axis of symmetry and the minimum or maximum value of the function.

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Name : Class :

(1) Complete the following:-

1) $12 : \dots\dots 15 \dots\dots = 4 : 5$

2) $x^2 : y = 4x^2y : \dots\dots 4y^2 \dots\dots$

3) $\frac{a^2c}{b^2d} : \frac{ac^2}{d^2b} = \dots\dots a.d \dots\dots : bc$

4) The proportion is the equality of two or more ratios

5) If $\frac{a}{b} = \frac{5}{7}$ then $a = \dots\dots 5m \dots\dots$, $b = \dots\dots 7m \dots\dots$

6) If $\frac{x}{y} = \frac{Z}{L} = \frac{5}{4}$, then $\frac{x+z}{y+l} = \dots\dots \frac{5}{4} \dots\dots$

7) If $\frac{a}{2} = \frac{b}{3} = \frac{5a-2b}{c}$, then $c = \dots\dots 4 \dots\dots$

8) If a, b, c are proportional, then $b = \dots\dots \pm \sqrt{ac} \dots\dots$

9) If $\frac{y}{x} = \frac{x}{z} = \frac{2}{5}$ then $y = \dots\dots \frac{4}{25} \dots\dots z$

10) The real numbers which make $(x+1), (x+5), (x+13)$ are proportional is 3

11) If $x, \sqrt{8}, 7, 14\sqrt{2}$ are four proportional quantities, then $x = \dots\dots 1 \dots\dots$

12) If $x : y = 3 : 1$, $x + y = 28$, then $x = \dots\dots 21 \dots\dots$, $y = \dots\dots 7 \dots\dots$

13) If $\frac{a}{b} = \frac{3}{5}$, $\frac{a}{c} = \frac{3}{7}$, then $\frac{c}{b} = \dots\dots \frac{7}{5} \dots\dots$

14) If $x \propto y$ then $x = \dots\dots m.y \dots\dots$

15) If $y \propto x^2$, then $y = \dots\dots m.x^2 \dots\dots$

16) If y varies inversely as x then y varies directly as $\dots\dots \frac{1}{x} \dots\dots$

17) If $y \propto x^2$ when z is constant of $y \propto \frac{1}{z}$ when x is constant, then $y \propto \dots\dots \frac{x^2}{z} \dots\dots$

18) If $a \propto \frac{1}{b}$, then $\frac{a1}{a2} = \dots\dots \frac{b2}{b1} \dots\dots$

19) The point of intersection of the two straight lines $y = -1$, $x - 2y = 1$ is $\dots\dots (-1, -1) \dots\dots$

20) If $\frac{a+b}{a+2b} = \frac{2}{5}$ then $a : b = \dots\dots 1:3 \dots\dots$

21) If 10 is the middle proportion between 4, x then $x = \dots 2.5 \dots$

22) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{3} = 2$ then $a = \dots 24 \dots$

23) If 4, -10, 5 x are proportional, then $x = \dots 5 \dots$

24) If $2xy = 3$ then $\dots \frac{1}{x} \dots$ ($y \propto x, y \propto \frac{1}{x}, y = \frac{1}{x}, y = \frac{2}{3}x$)

25) If y varies inversely as $(x+4)$, if $y=4$ as $x=1$ then the constant of the variation is $\dots 20 \dots$

(2a):-

If $\frac{x}{y} = \frac{2}{3}$, then find $\frac{x^2 + 2xy - y^2}{6xy}$ $x=2m, y=3m$

$$= \frac{(2m)^2 + 2(2m)(3m) - (3m)^2}{6(2m)(3m)} = \frac{4m^2 + 12m^2 - 9m^2}{36m^2} = \frac{7m^2}{36m^2} = \frac{7}{36}$$

b) Find the positive number which if we subtracted its square from each of the two terms

of the ratio $\frac{41}{91}$ the rest will be $\frac{1}{3}$

$$\frac{41-x^2}{91-x^2} = \frac{1}{3} \quad \therefore 91 - x^2 = \frac{1}{3}(41 - x^2) \quad \therefore 3(91 - x^2) = 41 - x^2 \quad \therefore 273 - 3x^2 = 41 - x^2 \quad \therefore 2x^2 = 232 \quad \therefore x^2 = 116 \quad \therefore x = \sqrt{116} = 10.77$$

***** (u) n/sol.

(3a):- $x^2 + 64y^2 = 16xy$, then find $\frac{2x+3y}{x-5y}$

$$\dots x^2 - 16xy + 64y^2 = 0 \quad \therefore x = 8y \quad \therefore \frac{2x+3y}{x-5y} = \frac{2(8y)+3y}{8y-5y} = \frac{19y}{3y} = \frac{19}{3}$$

b) If $\frac{a}{2x+y} = \frac{b}{3y-x} = \frac{c}{4x+5y}$ then prove that $\frac{a+2b}{4b+c} = \frac{7}{17}$

$$\frac{a+2b}{2x+y+6y-2x} = \frac{a+2b}{7y} = \frac{4b+c}{12y-4y+4x+5y} = \frac{4b+c}{17y} \quad \therefore \frac{a+2b}{4b+c} = \frac{7}{17}$$

(4):- If $y \propto (x-1)$, $y \propto \frac{1}{x}$ then find the relation between x & y if $x=3$ and $y=2$

$$y \propto \frac{x-1}{x} \quad \therefore y = m \left(\frac{x-1}{x} \right) \quad \therefore 2 = m \left(\frac{3-1}{3} \right) \quad \therefore m = 3 \left(1 - \frac{1}{x} \right) \quad \therefore y = 3 \left(1 - \frac{1}{x} \right)$$

(5):- If $2a = 3b = 4c$, then find $a : b : c$

$$\frac{2a}{12} = \frac{3b}{12} = \frac{4c}{12} \Rightarrow \frac{a}{6} = \frac{b}{4} = \frac{c}{3} \Rightarrow a : b : c = 6 : 4 : 3$$

(6):- If $x \times y = \{(1,1), (1,3), (1,5)\}$ find:

a) x, y b) $y \times x$ c) y^2

$$x = \{1\}, y = \{1, 3, 5\}$$

$$y \times x = \{(1,1), (1,3), (1,5)\}$$

$$y^2 = \{(1,1), (1,3), (1,5), (3,1), (3,3), (3,5), (5,1), (5,3), (5,5)\}$$

(6):- If $x = \{3, 4\}$, $y = \{4, 5\}$ and $z = \{6, 5\}$, find:

a) $x \times (y \cap z)$ b) $(x \cdot y) \times z$ c) $(x \cdot y) \times (y \cdot z)$

$$x \times (y \cap z) = \{3, 4\} \times \{5\} = \{(3,5), (4,5)\}$$

$$(x \cdot y) \times z = \{3\} \times \{6, 5\} = \{(3,6), (3,5)\}$$

$$(x \cdot y) \times (y \cdot z) = \{3\} \times \{4\} = \{(3,4)\}$$

(8):- Graph the linear fraction $f(x) = 3x - 1$ then find the point of intersection of the straight line with the two axes.

Put $x = 0$ $f(x) = 3(0) - 1 = -1$ $(0, -1)$ point of intersection with y-axis

Put $y = 0 \Rightarrow f(x) = 0 \Rightarrow 3x - 1 = 0 \Rightarrow x = \frac{1}{3}$ $(\frac{1}{3}, 0)$ intersection point with x-axis

(9):- Represent graphically the function $f: f(x) = x^2 - 2$ taken $x \in [-3, 3]$ and from the graph deduce the coordinates of point of vertex of curve, the equation of the axis of symmetry and the minimum or maximum value of the function.

Point of vertex of curve $= (0, -2)$

eq. of axis of symm $= x = 0$

min. value $= -2$

