

**ICSE Board**  
**Class VI Mathematics**  
**Sample Paper – 2 Solution**

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**Section A (40 marks)**

**Question 1:**

(a) Descending order:

- i. 15, 8, 3, 2, 0, -1, -6, -12
- ii. -6, -5, -4, -3, -2, -1, 0, 1, 2

(b) Let the total distance covered be 1 and the distance to be covered by train be  $x$ .

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

$$x = 1 - \frac{1}{2} - \frac{1}{3}$$

$$x = \frac{1}{6}$$

Hence Aruna covers  $\frac{1}{6}^{\text{th}}$  of the distance by train.

(c)

$$5x - 14 = x - (24 + 4x)$$

$$5x - 14 = x - 24 - 4x$$

$$5x - x + 4x = -24 + 14$$

$$8x = -10$$

$$x = \frac{-10}{8}$$

$$\therefore x = \frac{-5}{4}$$

$$\therefore x = -1\frac{1}{4}$$

(d)

- i. {3, 5, 7, .....} is a finite set - **False**
- ii. A line has infinite number of points on it - **True**
- iii.  $0.45 = 45\%$  - **True**

**Question 2:**

(a) The greatest number which can be formed is 9847, since 9 is the biggest digit followed by 8 and then by 4 and 7 is fixed at ones place.

The smallest number which can be formed is 4897, since 4 is the smallest digit followed by 8 and then by 9, and 7 is fixed at ones place.

(b)

i.  $y + 7$

ii.  $5 + m/23$

(c) The sides of a triangle are in the ratio 3 : 2 : 4.

Let the common multiple be x.

So, sides are 3x, 2x and 4x cm

Since the perimeter is 27cm,

$$3x + 2x + 4x = 27$$

$$9x = 27$$

$$x = 27/9$$

$$x = 3$$

$$3x = 3(3) = 9\text{cm}$$

$$2x = 2(3) = 6\text{cm}$$

$$4x = 4(3) = 12\text{cm}$$

(d) H.C.F. = 144; L.C.M. = 6480; One of the numbers = 720;

Now, we know that

Product of both numbers = H.C.F.  $\times$  L.C.M.

$$\therefore 720 \times \text{Second number} = 144 \times 6480$$

$$\text{Second number} = \frac{144 \times 6480}{720}$$

$$\text{Second number} = 1296$$

**Question 3:**

(a) Circle:

i. A sector and a chord

ii. AB is the diameter and it divides the circle in two equal halves.

(b) The digit in the units place of 505 is 5.

505 is divisible by 5.

According to the test for divisibility by 2, 505 is not divisible by 2.

The sum of the digits of 505 =  $5 + 0 + 5 = 10$  and 10 is not divisible by 3 and 9.

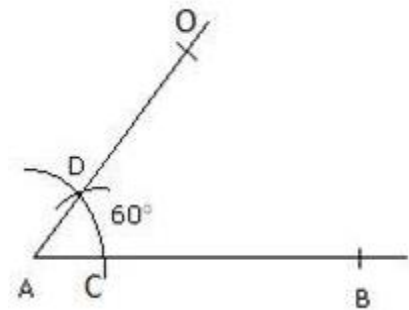
Hence, according to the test for divisibility by 3 and 9, 505 is not divisible by 3 and 9.

505 is not divisible by 2 and 3. Hence, 505 is not divisible by 6.

505 is not divisible by 2, 3, 4, 6 and 9 but is divisible by 5.

(c) Steps of Construction:

- i. Draw a ray AB.
- ii. With A as centre and any convenient radius draw an arc intersecting AB in point C.
- iii. With C as the centre and the same radius, draw a small arc intersecting the arc drawn in step 2 at D.
- iv. Join ray OA.  $\angle OAB$  is the required angle



**Question 4:**

(a)

$$\begin{aligned} & (-17x^2 - 2xy + 23y^2) + (-9y^2 + 15x^2 + 7xy) + (13x^2 + 3y^2 - 4xy) \\ &= -17x^2 + 15x^2 + 13x^2 - 2xy + 7xy - 4xy + 23y^2 - 9y^2 + 3y^2 \\ &= 11x^2 + xy + 17y^2 \end{aligned}$$

(b) Net 1: Cylinder

Net 2: Tetrahedron

Net 3: Cuboid

(c) H.C.F. of 780 and 462

$$\begin{array}{r} 462 \overline{) 780} \quad (1 \\ \underline{462} \\ 318 \\ 318 \overline{) 462} \quad (1 \\ \underline{318} \\ 144 \\ 144 \overline{) 318} \quad (2 \\ \underline{288} \\ 30 \\ 30 \overline{) 144} \quad (4 \\ \underline{120} \\ 24 \\ 24 \overline{) 30} \quad (1 \\ \underline{24} \\ 6 \\ 6 \overline{) 24} \quad (4 \\ \underline{24} \\ 0 \end{array}$$

**Section B (40 marks)**

**Question 5:**

(a) Algebraic form:

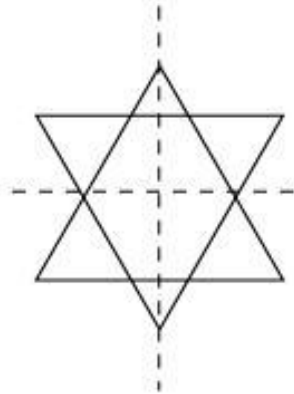
i.  $2x + 28 = 45$

ii.  $3y - 5z > 8x$

iii.  $\frac{6x}{13y} < 17$

(b) The line of symmetry of a figure is a line which divides the figure into two equal parts such that each part is a mirror image of the other.

Lines of symmetry for the given figure are shown as dotted lines.



(c)  $A = 340\text{m}^2$ ,  $b = 17\text{m}$ ,  $l = ?$ ,  $P = ?$

Area of rectangle =  $l \times b$

$340 = l \times 17 \Rightarrow l = 20 \text{ cm}$

Next,

Perimeter of a rectangle =  $2(l + b) = 2(20 + 17) = 74 \text{ cm}$

(d)

i. Let the amount of Royalty to be paid for these books be Rs.  $r$ .

Then,  $20 : 15 = 30600 : r$

$\Rightarrow r = \text{Rs.} \left( \frac{30600 \times 15}{20} \right)$

$= \text{Rs. } 22,9500$

ii. Central angle corresponding to Royalty = 15% of  $360^\circ$

$= \frac{15}{100} \times 360^\circ = 54^\circ$

**Question 6:**

$$\begin{aligned} \text{(a) } & (x + y - 2z) + (2x - y + z) - (x + y + z) \\ & = x + y - 2z + 2x + y + z - x - y - z \\ & = x + 2x - x + y + y - y - 2z - z - z \\ & = 2x + y - 2z \end{aligned}$$

(b) Since,  $2 + 3 + 4 = 9$

$$1^{\text{st}} \text{ part} = \frac{2}{9} \times 81 = 18$$

$$2^{\text{nd}} \text{ part} = \frac{3}{9} \times 81 = 27$$

$$3^{\text{rd}} \text{ part} = \frac{4}{9} \times 81 = 36$$

(c) It is given that the total weight of the tomatoes and onions is 60 kg and the ratio of their weights is 2 : 3.

60 kg can be divided into  $(2 + 3) = 5$  parts

$$\therefore \text{Total weight of tomatoes} = \frac{2}{5} \times 60 = 24 \text{ kg}$$

$$\text{Total weight of onions} = \frac{3}{5} \times 60 = 36 \text{ kg}$$

We know that the total money spent in buying the tomatoes and onions is Rs. 420 and the ratio of their prices is 8 : 27.

Therefore, Rs. 420 can be divided into  $(8 + 27) = 35$  parts

$$\therefore \text{Total price of tomatoes} = \frac{8}{35} \times 420 = \text{Rs. } 96$$

$$\text{Total price of onions} = \frac{27}{35} \times 420 = \text{Rs. } 324$$

Cost of 24 kg of tomatoes = Rs. 96

$$\therefore \text{Cost of 1 kg of tomatoes} = \text{Rs. } \frac{96}{24} = \text{Rs. } 4$$

$$\Rightarrow \text{Cost of 5 kg of tomatoes} = \text{Rs. } 4 \times 5 = \text{Rs. } 20$$

Cost of 36 kg of onions = Rs. 324

$$\therefore \text{Cost of 1 kg of onions} = \text{Rs. } \frac{324}{36} = \text{Rs. } 9$$

$$\Rightarrow \text{Cost of 5 kg of onions} = \text{Rs. } 9 \times 5 = \text{Rs. } 45$$

Thus, the cost of 5 kg of tomatoes and 5 kg of onions is Rs.  $(20 + 45) = \text{Rs. } 65$ .

**Question 7:**

$$\begin{aligned} \text{(a) } & 3(a + b) - 2(2a - b) + 4a - 7 \\ & = 3a + 3b - 4a + 2b + 4a - 7 \\ & = (3a - 4a + 4a) + (2b + 3b) - 7 \\ & = 3a + 5b - 7 \end{aligned}$$

$$\begin{aligned} \text{(b) Length of the rectangular park} & = 250 \text{ m} \\ \text{Breadth of the rectangular park} & = 175 \text{ m} \\ \text{Perimeter of the rectangular park} & = 2(\text{length} + \text{breadth}) \\ & = 2(250 + 175) \\ & = 850 \text{ m} \\ \text{Cost of fencing 1m of the park} & = \text{Rs. } 12 \\ \therefore \text{Total cost of fencing the park} & = \text{Rs. } 12 \times 850 = \text{Rs. } 10,200 \end{aligned}$$

$$\begin{aligned} \text{(c) 1) Set of factors of 48:} \\ \text{Roster form} & = \{1, 2, 3, 4, 6, 8, 12, 16, 24, 48\} \\ \text{Set builder form} & = \{x : x \text{ is a factor of } 48\} \\ \\ \text{2) Set of integers between -3 and 8} \\ \text{Roster form} & = \{-2, -1, 0, 1, 2, 3, 4, 5, 6, 7\} \\ \text{Set builder form} & = \{x : x \text{ is an integer and } -3 \leq x \leq 8\} \end{aligned}$$

**Question 8:**

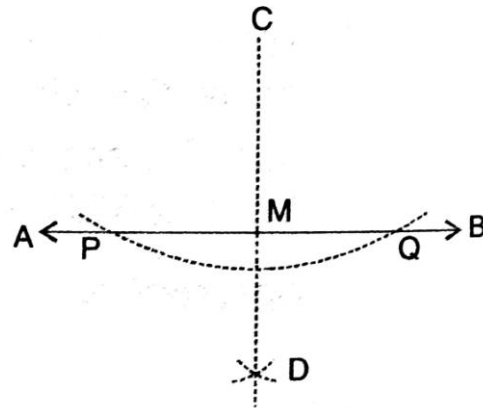
$$\begin{aligned} \text{(a) Total number of students} & = 1625 \\ \text{Total number of girls} & = 750 \\ \therefore \text{The total number of boys} & = 1625 - 750 = 875 \\ \text{Ratio} & = \frac{875}{750} = \frac{7}{6} = 7 : 6 \end{aligned}$$

(b) To draw a perpendicular to a given line from a point outside the line.

Let AB be the given line and let C be an external point.

Steps:

- i. Taking C as the centre, draw an arc of some suitable radius; which cuts AB at two points P and Q.
- ii. With P and Q as centres, draw two arcs of equal radii cutting each other at point D on the other side of AB.
- iii. Join C and D. Let CD cut line AB at point M. **CM is the required perpendicular on the given line AB from the exterior point C.**

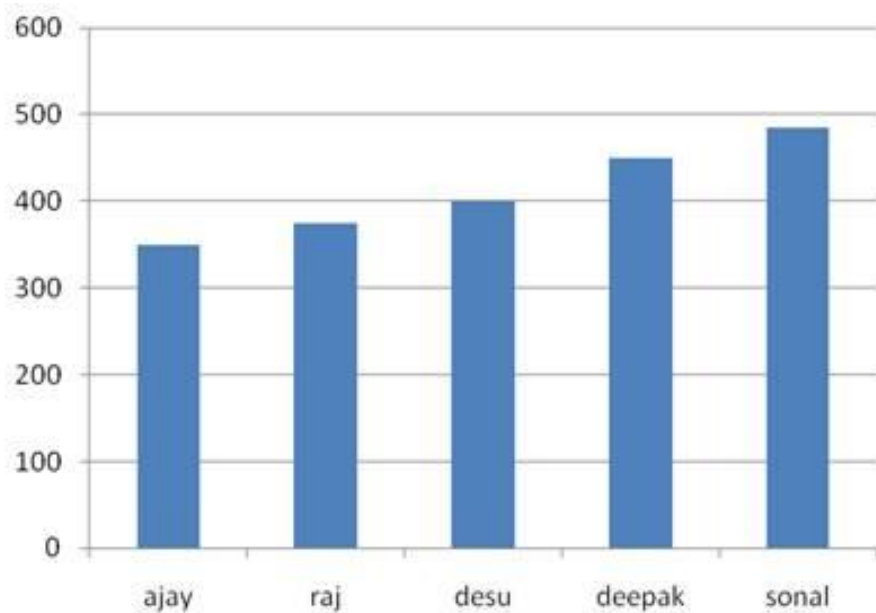


(c)

$$\begin{aligned}
 & 3x^3 - 4x^2 + 5x - 6 \\
 & = 3(-1)^3 - 4(-1)^2 + 5(-1) - 6 \\
 & = 3(-1) - 4(1) + (-5) - 6 \\
 & = -3 - 4 - 5 - 6 \\
 & = -18
 \end{aligned}$$

**Question 9:**

(a) The bar graph is as follows:



(b) Types of sets:

- i. Empty set
- ii. Infinite set
- iii. Finite set

(c)

$$\begin{aligned}
 & \left( \frac{4}{5} - \frac{1}{4} \right) \div \left( 1\frac{9}{20} + 1\frac{3}{10} \right) \\
 &= \left( \frac{4 \times 4 - 1 \times 5}{20} \right) \div \left( \frac{29}{20} + \frac{13}{10} \right) \\
 &= \left( \frac{16 - 5}{20} \right) \div \left( \frac{29 \times 1 + 13 \times 2}{20} \right) \\
 &= \left( \frac{11}{20} \right) \div \left( \frac{29 + 26}{20} \right) \\
 &= \left( \frac{11}{20} \right) \div \left( \frac{55}{20} \right) \\
 &= \frac{\cancel{11}}{20} \times \frac{\cancel{20}}{55} \\
 &= \frac{1}{5}
 \end{aligned}$$