

ICSE Board
Class VI Mathematics
Sample Paper – 1 Solution

Section A (40 marks)

Question 1

(a) $-146 - 78 + 124 + 69$
 $= -(146 + 78) + (124 + 69)$
 $= -224 + 193 = -31$

(b) Here length = 4.5 cm and breadth = 3.0 cm
Area of a rectangle = $l \times b = 4.5 \times 3.0 = 13.5 \text{ cm}^2$

(c) The digit in the units place of 378 is 8.
According to the test for divisibility by 2, 278 is divisible by 2.
The sum of the digits of 378 = $3 + 7 + 8 = 18$ and 18 is divisible by 3 and 9.
Hence, according to the test for divisibility by 3 and 9, 378 is divisible by 3 and 9.
378 is divisible by 2 and 3. Hence, 378 is divisible by 6.
378 is divisible by 2, 3, 6 and 9.

- (d)
- i. $n(\emptyset) = 1$ -**False**
 - ii. If two angles of a triangle are obtuse, then it is called an obtuse angled triangle -
False
 - iii. $2x - 3y + 5z^2$ is a trinomial. -**True**

Question 2

(a) Let one of the angles be x , then the other angle is $(4x + 5)$.
As the given angles are supplementary, we have
 $x + (4x + 5) = 180^\circ$
 $\Rightarrow 5x = 180 - 5 \Rightarrow 5x = 175^\circ$
 $\Rightarrow x = 35^\circ$
And, $4x + 5 = 4(35) + 5 = 145^\circ$
Hence the required angles are 35° and 145° .

(b) Ratio of Manjeet's Income to Sanjeet's Income
 $= 27000 : 18000$
 $= 3 : 2$

(c) L.C.M. of 120, 210 and 225 is calculated as follows:

	120, 210, 225
2	
2	60, 105, 225
2	30, 105, 225
3	15, 105, 225
3	5, 35, 75
5	5, 35, 25
5	1, 7, 5
7	1, 7, 1
	1, 1, 1

$$\text{L.C.M.} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7 = 12600$$

$$\begin{aligned} \text{(d)} \quad 1\frac{2}{3} + \frac{5}{8} - \frac{7}{12} + 4\frac{4}{15} &= \frac{5}{3} + \frac{5}{8} - \frac{7}{12} + \frac{64}{15} \\ &= \frac{200 + 75 - 70 + 512}{120} \\ &= \frac{717}{120} \\ &= 5\frac{39}{40} \end{aligned}$$

Question 3

(a)

i. Digit 3 is always at the tens place

Greatest			
Th	H	T	U
9	8	3	7

Smallest			
Th	H	T	U
1	0	3	2

Similarly,

ii. Digit 8 is always at hundreds place: 9876, 1802

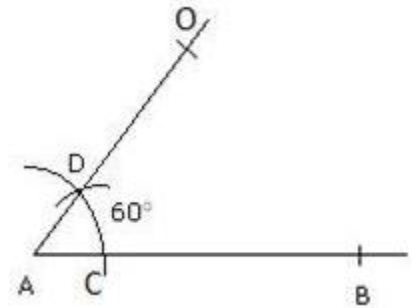
iii. Digit 5 is always at thousands place: 5987, 5012

(b) Substituting $a = 2$, $b = -1$ in the given equation, we get

$$\begin{aligned} &2a^3 - b^4 + 3a^2b^3 - 3ab^2 \\ &= 2(2)^3 - (-1)^4 + 3(2)^2(-1)^3 - 3(2)(-1)^2 \\ &= 16 - 1 - 12 - 6 = -3 \end{aligned}$$

(c) Steps of Construction:

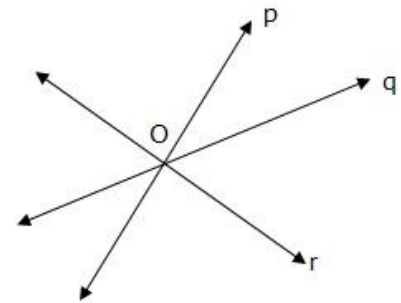
- i. Draw a ray AB.
- ii. With A as centre and any convenient radius draw an arc intersecting AB in point C.
- iii. With C as the centre and with same radius, draw a small arc intersecting the arc drawn in step 2 at D.
- iv. Join ray OA. ΔOAB is the required angle.



Question 4

(a)

- i. Lines p, q and r are intersecting lines.
- ii. Point at which the lines meet is called the point of intersection. The point O represents the point of intersection.
- iii. Infinite number of lines can pass through the point O (point of intersection).



(b) $8(a^2 - a - 1) + 5(2a - 2) - 3(a^2 + a - 1)$
 $= 8a^2 - 8a - 8 + 10a - 10 - 3a^2 - 3a + 3$
 $= 8a^2 - 3a^2 - 8a + 10a - 3a - 8 - 10 + 3$
 $= 5a^2 - a - 15$

(c) Let the cost of one sandwich be Rs. x

\therefore Cost of 3 sandwiches = Rs. 3x

Tip given to the waiter = Rs. 7

Total amount spent = Rs. 100

$\therefore 3x + 7 = 100$

$\therefore 3x = 100 - 7$

$\therefore 3x = 93$

$\therefore x = 31$

Hence, cost of one sandwich = Rs. 31

Section B (40 marks)

Question 5

(a) The given expression:

$$\begin{aligned} & 53.5 - 34.68 + 64.75 - 28.9 \\ & = (53.5 + 64.75) - (34.68 + 28.9) \\ & = 118.25 - 63.58 \\ & = 54.67 \end{aligned}$$

$$\begin{array}{r} 53.50 \quad 34.68 \quad 118.25 \\ +64.75 \quad +28.90 \quad - 63.58 \\ \hline 118.25 \quad 63.58 \quad 54.67 \end{array}$$

(b) First add the total number of women and children,

$$\begin{array}{r} 786324 \\ + 8642 \\ \hline 794966 \end{array}$$

Now, we need to find the number of men from the total population,

$$\begin{array}{r} 1300000 \\ - 794966 \\ \hline 505034 \end{array}$$

Hence, the total number of men is 505034.

(c) Here, product of numbers = 5760, H.C.F. = 24, L.C.M. = ?

Now, H.C.F. × L.C.M. = Product of two numbers

$$\Rightarrow 24 \times \text{L.C.M.} = 5760$$

$$\Rightarrow \text{L.C.M.} = \frac{5760}{24} = 240$$

(d) (a) Maximum potatoes were consumed on Sunday.

(b) The consumption of potatoes went down on Thursday.

(c) The combined consumption of potatoes on Monday, Tuesday and Wednesday
= 15 + 20 + 30 = 65 kg

Question 6

(a) Solution: Time taken by the painter to paint 20 m² of the wall = 10 hours [Given]

$$\therefore \text{Time taken to paint } 1 \text{ m}^2 = \frac{10}{20} \text{ hours} = \frac{1}{2} \text{ hour}$$

$$\Rightarrow \text{Time taken to paint } 30 \text{ m}^2 = \left(\frac{1}{2} \times 30 \right) \text{ hours} = 15 \text{ hours}$$

Thus, the painter will take 15 hours to paint a wall of area 30 m².

$$\begin{aligned}
 \text{(b) } & 15a^2 - 6a(a - 2) + a(3 + 7a) \\
 & = 15a^2 - 6a \times a + 6a \times 2 + a \times 3 + a \times 7a \\
 & = 15a^2 - 6a^2 + 12a + 3a + 7a^2 \\
 & = (15a^2 - 6a^2 + 7a^2) + 12a + 3a \\
 & = 16a^2 + 15a
 \end{aligned}$$

$$\begin{aligned}
 \text{(c) } & A = \{C, H, A, N, D, I, G, R\}, B = \{R, A, J, S, T, H, N\} \\
 \text{i. } & A \cap B = \{H, A, N, R\} \\
 \text{ii. } & A \cup B = \{C, H, A, N, D, I, G, R, J, S, T\} \\
 \text{iii. } & n(A) = 8, \quad n(B) = 7 \\
 \text{iv. } & n(A \cap B) = 4, \quad n(A \cup B) = 11 \\
 \text{v. } & \text{L.H.S.} = n(A \cup B) = 11 \\
 & \text{R.H.S.} = n(A) + n(B) - n(A \cap B) = 8 + 7 - 4 = 11 \\
 & \text{Hence, } n(A \cup B) = n(A) + n(B) - n(A \cap B)
 \end{aligned}$$

Question 7

(a) First we find the factors of 1095 and 1168.

$$1095 = 3 \times 5 \times 73$$

$$1168 = 2 \times 2 \times 2 \times 2 \times 73$$

Hence,

$$\frac{1095}{1168} = \frac{3 \times 5 \times \cancel{73}}{2 \times 2 \times 2 \times 2 \times \cancel{73}} = \frac{15}{16}$$

(b) Let the fourth term be x .

$$21 : 7 :: 9 : x \quad \text{or} \quad 21 : 7 = 9 : x$$

Product of means = Product of extremes

$$21 \times x = 7 \times 9$$

$$x = 63 \div 21$$

$$x = 3$$

(c) Area = 144 sq. m., $l = 16$ m, $b = ?$ Perimeter = ?

Area of a rectangular plot = $l \times b$

$$\therefore 144 = 16 \times b \Rightarrow b = 9 \text{ m}$$

\therefore Breadth of the rectangular plot = 9 m

Next, we need to find the cost of painting a blue border around the rectangular plot.

$$\text{Perimeter of the plot} = 2(l + b) = 2(16 + 9) = 50 \text{ m}$$

Now, cost of painting the blue border = Rs. 3 per metre

$$\therefore \text{Cost of painting the entire rectangular plot} = \text{Rs. } 3 \times 50 = \text{Rs. } 150$$

Question 8

$$\begin{aligned}
 \text{(a) } & 16 - [5 - 2 + \{7 \text{ of } 2 - (6 \div 3 \times 2 - 1 + 3)\}] \\
 & = 16 - [5 - 2 + \{7 \text{ of } 2 - (2 \times 2 - 1 + 3)\}] \\
 & = 16 - [5 - 2 + \{7 \text{ of } 2 - (4 - 1 + 3)\}] \\
 & = 16 - [5 - 2 + \{7 \text{ of } 2 - 6\}] \\
 & = 16 - [5 - 2 + \{8\}] \\
 & = 16 - 11 \\
 & = 5
 \end{aligned}$$

(b) Angle formed on straight line = 180°

$$3x + 50^\circ + 2x + 10^\circ = 180^\circ$$

$$\Rightarrow 5x + 60^\circ = 180^\circ$$

$$\Rightarrow 5x = 180^\circ - 60^\circ$$

$$\Rightarrow 5x = 120^\circ$$

$$\Rightarrow x = 24^\circ$$

$$\text{Then, } m\angle POQ = 2x + 10 = 2(24) + 10 = 58^\circ$$

$$m\angle ROS = 3x = 3(24) = 72^\circ$$

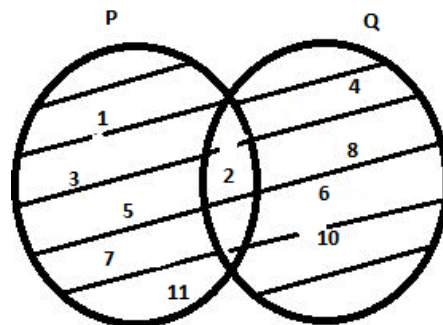
(c) Here $P = \{1, 2, 3, 5, 7, 11\}$, $Q = \{2, 4, 6, 8, 10\}$

$$\text{Then, } P \cup Q = \{1, 2, 3, 4, 5, 6, 7, 8, 10, 11\}$$

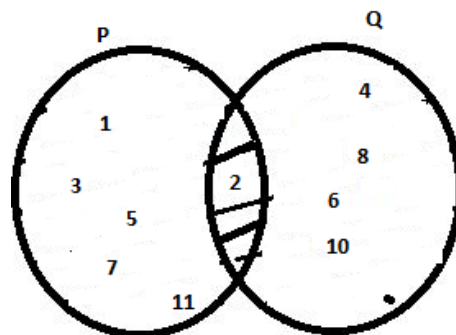
$$P \cap Q = \{2\}$$

$(P \cup Q)$ and $(P \cap Q)$ are represented by the following Venn-diagrams.

i. $(P \cup Q)$



ii. $(P \cap Q)$



Question 9

(a) The bar graph is as follows:



(b) Total weight of the sheep = 82 kg

Weight of tail = 8.5% of the weight of the sheep

$$= 8.5\% \text{ of } 82$$

$$= \frac{8.5}{100} \times 82 = 6.970$$

Hence, weight of sheep's tail is **6.970 kg**.

(c) Perimeter = Sum of all sides

$$= AB + BC + CD + DE + EF + FA$$

$$= 11 + 9 + 3 + 4 + 8 + 5 \quad \dots (DE = CG = 9 - 5 = 4 \text{ cm})$$

$$= 40 \text{ cm}$$

Area = Area of rectangle ABCF + Area of rectangle CDEG

$$= (11 \times 5) \text{ cm}^2 + (4 \times 3) \text{ cm}^2$$

$$= 55 \text{ cm}^2 + 12 \text{ cm}^2 = 67 \text{ cm}^2$$