CBSE Board
Class VIII Mathematics
Term II
Sample Paper 2 – Solution

Time: 2 ½ hours Total Marks: 80

Section A

1. Correct answer: D

$(t^2 + 3)(t + \sqrt{3})(t - \sqrt{3}) = (t^2 + 3)[t^2 - (\sqrt{3})^2]$

$= (t^2 + 3)(t^2 - 3)$

$= (t^2)^2 - (3)^2$

$= t^4 - 9$

$[(x - y)(x + y) = x^2 - y^2]$

2. Correct answer: C

The given shape has 6 vertices.

3. Correct answer: C

Surface area of the rectangular prism $= 2(lb + bh + hl)$

$= 2(4 \times 3 + 3 \times 5 + 5 \times 4)$

$= 2(12 + 15 + 20) = 2 \times 47 = 94\ m^2$

$\therefore$ Cost of painting wooden block of surface area $94\ m^2$ = Rs 5×94 = Rs 470

4. Correct answer: D

Let one number be x and the other number be (80 – x).

From the given information, we have

$$\frac{x}{80-x} = \frac{3}{5}$$

$$\Rightarrow 5x = 240 - 3x$$

$$\Rightarrow 5x + 3x = 240$$

$$\Rightarrow 8x = 240$$

$$\Rightarrow x = \frac{240}{8} = 30$$

Thus, the two numbers are 30 and (80 – 30) = 50.

Hence, the greatest number amongst the two is 50.

5. Correct answer: A

$$\left\{\left(\frac{1}{5}\right)^{-2} - \left(\frac{1}{4}\right)^{-3}\right\} \times \left(\frac{-1}{2}\right)^{-4}$$

$= \{5^2\text{-}4^3\} \times (-2)^4$

$= \{25\text{-}64\} \times 16$

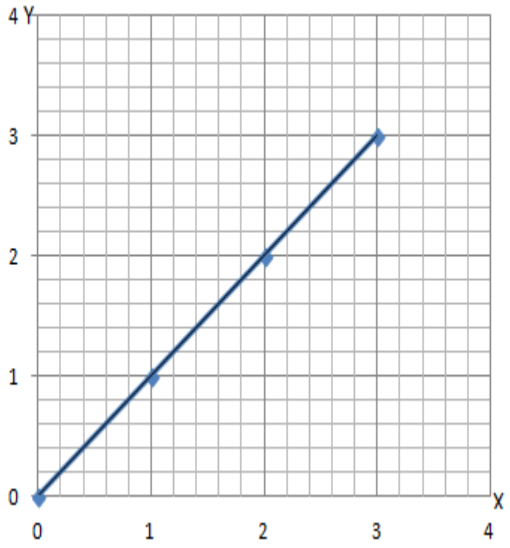
$= -39 \times 16$

$= -624$

Hence, the simplified value is -624.

6. Correct answer: D
Here, $6 \times a = 3 \times 4$
Therefore, $a = 2$.

7. Correct answer: B
A straight line



8. Correct answer : D

A rational number is a number of the form $\frac{p}{q}$ where $q \neq 0$. So in case of reciprocal of 0, denominator will be 0.

9. Correct answer: C
Cuboid is a polyhedron because its faces are congruent and regular polygons. Also, its vertices are formed by same number of faces.

10. Correct answer: A

$1^3 = 1$

Thus, the natural number 1 is equal to its cube.

11. Correct answer: D

$$\text{Sales tax} = \frac{4}{100} \times 380 = 15.20$$

12. Correct answer: C

$$\frac{4}{x-1} = \frac{3}{x+7}$$

On cross-multiplying, we get

$4x + 28 = 3x - 3$

$4x - 3x = -3 - 28$

$x = -31$

$x + 31 = 0$

Section B

13.

$$(a^{50}b^{51})(b^{49}c^{67})(c^{33}d)(c^{99}a^{50})$$

$$= (a^{50} \times a^{50})(b^{51} \times b^{49})(c^{67} \times c^{33} \times c^{99})(d)$$

$$= (a^{50+50})(b^{51+49})(c^{67+33+99})(d)$$

$$= a^{100}b^{100}c^{199}d$$

14. $82^2 = (80 + 2)^2$

In the property $(a + b)^2 = a^2 + b^2 + 2ab$, putting $a = 80$ and $b = 2$, we get

$(80 + 2)^2 = 80^2 + 2^2 + 2 \times 80 \times 2$

$= 6400 + 4 + 320$

$= 6724$

15.

(i) $100 \times 7 + 10 \times 9 + 1 \times 8 = 700 + 90 + 8 = 798$

(ii) $1000 \times 3 + 100 \times 1 + 10 \times 5 + 1 \times 9$

$= 3000 + 100 + 50 + 9$

$= 3159$

16.

Area of 4 walls is $= 2(bh + hl)$

$= 2(b + l)h$

$=$Perimeter $\times h$

$=50 \times 2.5$

$=125\ m^2$

Hence, the area of 4 walls is 125 m^2.

17. $3x^2 + 7x + 14 + 6x$

By regrouping of terms, we have

$\underline{3x^2 + 6x} + \underline{7x + 14}$

Taking out common factor from underlined terms, we get

$= 3x\underline{(x + 2)} + 7\underline{(x + 2)}$

Again, taking out the underlined common factor, we have

$= (x + 2)(3x + 7)$

18. Let the required number be x. Then,

26% of x = 65

$\Rightarrow \frac{26}{100}x = 65$

$\Rightarrow x = \left(65 \times \frac{100}{26}\right)$

$\Rightarrow x = 250$

Hence, the required number is 250.

19. Consider:

$$\begin{array}{r} 3\ 1\ A \\ +\ 1\ A\ 3 \\ \hline 5\ 0\ 1 \end{array}$$

At one's place, A + 3 = _1

So think of a number which when added to 3 gives one's place as 1.

Such a number is 8 as 8 + 3 = 11

Taking, A = 8, we obtain the addition as below:

$$\begin{array}{r} 3\ 1\ 8 \\ +\ 1\ 8\ 3 \\ \hline 5\ 0\ 1 \end{array}$$

20.

(i) $\frac{1}{27} = \frac{1}{3 \times 3 \times 3} = \frac{1}{3^3} = 3^{-3}$

(ii) $\frac{-1}{32} = \frac{-1}{2 \times 2 \times 2 \times 2 \times 2} = \frac{-1}{2^5} = \frac{(-1)^5}{2^5} = \left(\frac{-1}{2}\right)^5$

21. A number is divisible by 4 if the number formed by its last two digits is divisible by 4.

(i) Consider 45748
Number formed by last two digits is 48.
Since, 48 is divisible by 4.
Hence, 45748 is also divisible by 4.

(ii) Consider 21404
Number formed by last two digits is 04.
Since, 04 is divisible by 4.
Hence, 21404 is also divisible by 4.

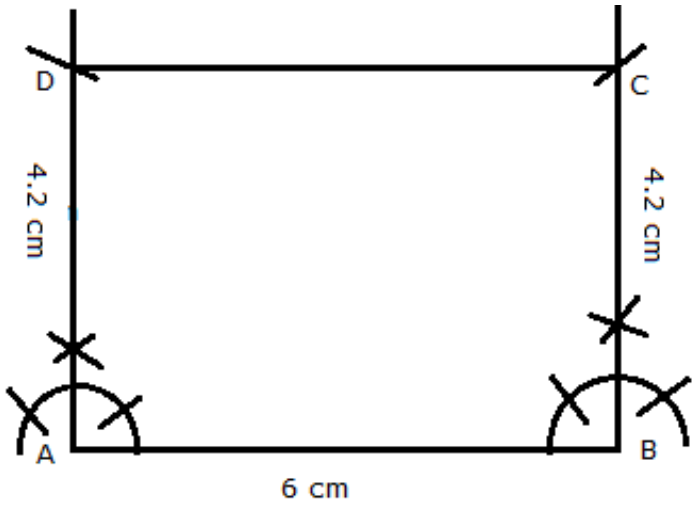
22. Here, F = 10, E = 20 and V = 15
We have
F + V - E = 10 + 15 - 20
= 25 - 20 = 5
Hence, F + V - E ≠ 2
Thus, such a polyhedron is not possible.

23. Distance = 1,433,500,000,000 m
= 14335 × 100000000 m
= 14335 × 10^8 m
= 1.4335 × 10^{12} m

24. Steps of construction:

1) Draw a line segment AB = 6 cm.
2) At A and B, draw two perpendicular rays.
3) With A and B as centers and radius 4.2 cm, draw arcs to cut the perpendiculars at points C and D.
4) Join CD.

ABCD is the required rectangle.



Section C

25. Population of village = 5000

Water required per person per day = 120 liters

Therefore,

Need of water for 5000 persons per day = 120 × 5000 = 6,00,000 liters

Now, capacity of water tank = 20 × 20 × 3 = 1200 m^3 = 1200 × 1000 = 12,00,000 liters

Thus, number of days = $\frac{1200000}{600000} = 2$

Hence, the water of this tank will last for 2 days.

26.

Here, $\frac{u}{v} = \frac{12}{16} = \frac{3}{4}$ ...(a)

(i) Let u = 6 and v = 8

Therefore, $\frac{u}{v} = \frac{6}{8} = \frac{3}{4}$

Since the ratio is same as in (a), so it is the corresponding value of u and v.

(ii) Let u = 15 and v = 20

Therefore, $\frac{u}{v} = \frac{15}{20} = \frac{3}{4}$

Since the ratio is same as in (a), so it is the corresponding value of u and v.

(ii) Let u = 18 and v = 22

Therefore, $\frac{u}{v} = \frac{18}{22} = \frac{9}{11}$

Since the ratio is not same as in (a), so it is not the corresponding value of u and v.

27.

Since, y + 2 is a factor of $4y^4+2y^3-3y^2+8y+5a$, the remainder will be zero.

Using Long Division, we have

$$
\begin{array}{r}
4y^3-6y^2+9y-10 \\
y+2\overline{)\;4y^4+2y^3-3y^2+8y+5a} \\
\underline{(-)4y^4+8y^3} \\
-6y^3-3y^2+8y+5a \\
\underline{(-)-6y^3-12y^2} \\
9y^2+8y+5a \\
\underline{(-)9y^2+18y} \\
-10y+5a \\
\underline{(-)-10y-20} \\
5a+20
\end{array}
$$

Now, 5a + 20 = 0

$\Rightarrow 5a = -20$
$\Rightarrow a = -4$

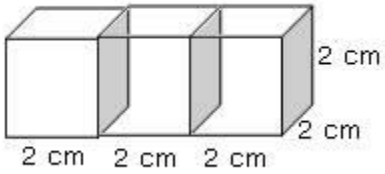
28.

(a) Maximum consumption of potatoes was on Sunday.

(b) On Thursday, the consumption of potatoes went down.

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

29.



The edge of given cube = 2 cm

Now, the length of cuboid formed = 2 + 2 + 2 = 6 cm

Breadth of cuboid = 2 cm

Height of cuboid = 2 cm

Therefore total surface area of cuboid

$= 2(lb + bh + hl)$

$= 2(12 + 4 + 12)$

$= 2 \times 28 = 56 \text{ cm}^2$

30. Let the smallest side of the triangle be x cm.

From the given information,

$x = \frac{1}{3}$ (biggest side – 5)

Biggest side = 3x + 15

Also, $x = \frac{1}{2}$(third side – 3)

Third side = 2x + 6

Perimeter of triangle = Smallest side + biggest side + third side

Perimeter = x + (3x + 15) + (2x + 6) = 39

6x + 21 = 39

6x = 39 - 21

6x = 18

x = 3

Smallest side = 3 cm

Biggest side = 3x + 15 = (3 × 3) + 15 = 24 cm

Third side = 2x + 6 = (2 × 3) + 6 = 12 cm

31. For every natural number m > 1, 2m, $m^2 + 1$, $m^2 - 1$ is a Pythagorean triplet.

Let $m^2 + 1 = 10$

$\Rightarrow m^2 = 9$

$\Rightarrow m = 3$

Therefore,

$2m = 6$, $m^2 - 1 = 8$

Thus, the triplet is 6, 8, 10.

But, 10 is not the smallest member of this.

So, let us try $2m = 10$

$\Rightarrow m = 5$

Therefore,

$m^2 + 1 = 25 + 1 = 26$

$m^2 - 1 = 25 - 1 = 24$

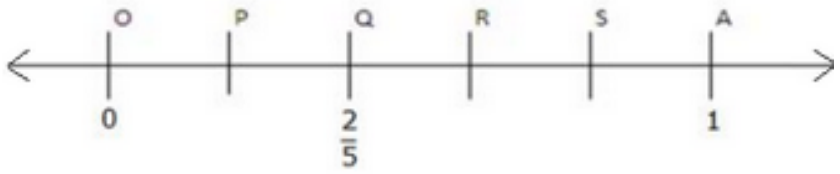
Thus, the required Pythagorean triplet is (10, 24, 26).

32. The number $\frac{2}{5}$ lies between 0 and 1.

Draw a number line. Mark points O and A to represent 0 and 1, respectively.

Divide OA into 5 equal parts (equal to the denominator of $\frac{2}{5}$).

The second point, Q, represents the rational number $\frac{2}{5}$.



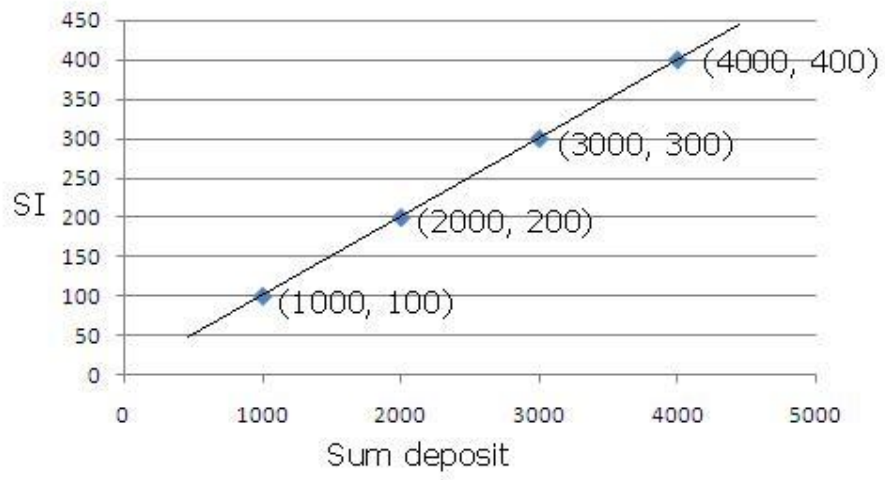
Section D

33. To draw the graph we assume the deposit sum to be Rs 1000, Rs 2000, Rs 3000 and Rs. 4000.

Now we calculate the SI for 1 year for the sum deposit.

Sum deposit	SI
Rs. 1000	$\frac{1000 \times 1 \times 10}{100} = \text{Rs } 100$
Rs. 2000	$\frac{2000 \times 1 \times 10}{100} = \text{Rs } 200$
Rs. 3000	$\frac{3000 \times 1 \times 10}{100} = \text{Rs } 300$
Rs. 4000	$\frac{4000 \times 1 \times 10}{100} = \text{Rs } 400$

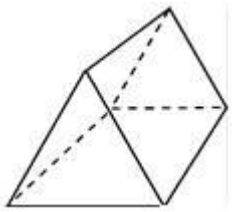
Plotting the points (1000, 100), (2000, 200), (3000, 300) and (4000, 400), we get the graph as below:



34.

(i) Prism: A prism is a solid whose bases are identical polygon faces and the other faces are rectangles. A triangular prism has triangle at the ends.

Diagram:



Verification of Euler's formula:

Here, F = 5, V = 6 and E = 9

Thus, F + V - E = 5 + 6 - 9 = 11 - 9 = 2

F + V - E = 2

Hence, Euler's formula is verified.

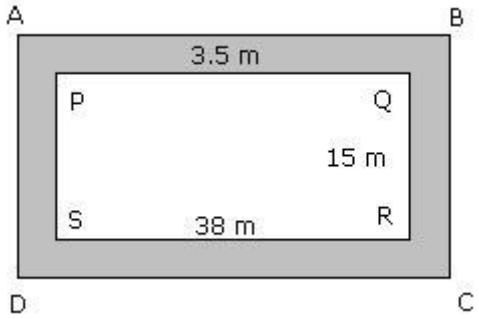
(ii) Cylinder: Cylinder is a solid shape in which top and bottom are circular, while the remaining surface is curved.

Diagram:

Number of faces = 3

Number of edges = 2

35. The given data can be shown in a figure as follows:



Let PQRS represent the rectangular park and the shaded region represent the path 3.5 m wide.

Thus, to find the length AB and breadth BC, we have to add 3.5 m to both sides of rectangular park whose dimensions are 38×15 m^2.

So, the length and breadth of the path are:

Length AB = (38 + 3.5 + 3.5) m = 45 m

Breadth BC = (15 + 3.5 + 3.5) m = 22 m

So, perimeter of the path = $2 \times$ (l + b)

= $2 \times$ (45 + 22)

= $2 \times$ 67 = 134 m

Thus, perimeter of the path is 134 m.

36.

(i) $548 = 500 + 40 + 8 = 5 \times 100 + 4 \times 10 + 8 \times 1$

(ii) $6985 = 6000 + 900 + 80 + 5 = 6 \times 1000 + 9 \times 100 + 8 \times 10 + 5 \times 1$

(iii) $85 = 80 + 5 = 8 \times 10 + 5 \times 1$

(iv) $365 = 300 + 60 + 5 = 3 \times 100 + 6 \times 10 + 5 \times 1$

37.

(i) $\frac{x + 0.25}{3} - x = 0.5$

LCM of 3 and 1 = 3

$\frac{x + 0.25 - 3z}{3} = 0.5$

Multiplying both sides with 3, we get

$0.25 - 2x = 0.5 \times 3$

$0.25 - 2x = 1.5$

Transposing 0.25 to the right hand side

$-2x = 1.5 - 0.25$

$\Rightarrow -2x = 1.25$

$\Rightarrow x = -\frac{1.25}{2}$

(ii) Transposing $\frac{(3x - 1)}{9}$ and -2,

$\frac{(5x + 1)}{12} - \frac{(3x - 1)}{9} = 2$

L.C.M of 12 and 9 = 36

$\frac{3(5x + 1) - 4(3x - 1)}{36} = 2$

Multiplying both sides with 36, we get:

$15x + 3 - 12x + 4 = 72$

$3x = 72 - 7 = 65$

$x = \frac{65}{3} = 21.67$