CBSE Board
Class VIII Mathematics
Term II
Sample Paper 1 – Solution

Time: 2 ½ hours Total Marks: 80

Section A

1. Correct option: B

$\sqrt[3]{1000} = \sqrt[3]{5\times2\times5\times2\times5\times2} = \sqrt[3]{5^3\times2^3} = 5\times2 = 10$

2. Correct option: B

For a hexagonal prism, V = 12, E = 18

Applying Euler's formula: F + V - E = 2

F = 2 + E – V = 2 + 18 – 12 = 8

3. Correct option: C

$\sqrt{484} = \sqrt{2\times2\times11\times11} = \sqrt{2^2\times11^2} = 2\times11 = 22$

4. Correct option: D

Area of square = 49 cm^2 = 7^2 cm^2

Therefore, side of square is = 7 cm

So the perimeter of square = 7 × 4 = 28 cm

5. Correct answer: C

$2\frac{2}{3} = \frac{8}{3}$

Thus, the multiplicative inverse of $2\frac{2}{3}$ is $\frac{3}{8}$.

6. Correct option: C

$\frac{480}{x} = \frac{15}{5}$

$\Rightarrow x = \frac{480\times5}{15} = 160$

7. Correct option: A

$\frac{6k+17}{k} = \frac{29}{2}$

$\Rightarrow 12k+34 = 29k$

$\Rightarrow 17k = 34 \Rightarrow k = 2$

8. Correct option: D

Each of the three expressions are with minimum power of x is 2; power of y is 2 and no power of z, so the greatest common factor of the three expressions is x^2y^2.

9. Correct answer: A

Central angle = $\frac{\text{Value of component}}{\text{Total value}} \times 360^o = \frac{1}{4} \times 360^o = 90^o$

10. Correct answer: C

$a^2 - 2ab + b^2 = a^2 - ab - ab + b^2 = a(a - b) - b(a - b) = (a - b)^2$

11. Correct answer: C

(2, 2) lies on the graph of y = x as x = 2 and y = 2 i.e., x = y

12. Correct answer: C

If the unit place of a number is zero then it is divisible by both 5 and 10.

Section B

13.

(i)

$$\left(2^5 \div 2^8\right) \times 2^{-7} = \left(2^{5-8}\right) \times 2^{-7}$$
$$= 2^{-3} \times 2^{-7}$$
$$= 2^{-3+(-7)}$$
$$= 2^{-10}$$
$$= \frac{1}{2^{10}}$$

(ii)

$$\left[\left(\frac{3}{2}\right)^{-2}\right]^3 = \left(\frac{3}{2}\right)^{-2\times 3}$$
$$= \left(\frac{3}{2}\right)^{-6}$$
$$= \left(\frac{2}{3}\right)^{6}$$

14. 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.
48 is divisible by 4.
Hence, 45748 is also divisible by 4.

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

15. Since ABCD is an isosceles trapezoidal, we have AD = BC.
Therefore, AD = BC = 4 cm.
Now the perimeter of given trapezium = AB + BC + CD + DA
= 12 + 4 + 8 + 4= 28
Hence, the perimeter of the given trapezium is 28 cm.

16. From the graph, it is clear that 5 students favoured orange and 1 student favoured green.
Now, 5 – 1 = 4
Therefore, 4 more students favoured orange colour than green.

17. Let x be the greater part.
Then, $64-x$ is the smaller part.
Now, according to condition given,
$3x=5(64-x)$
$3x=320-5x$
3x + 5x = 320
8x = 320
x = 40
Hence, the two parts are 40 and 24.

18. Here,
Total number of outcomes = 10 + 25 = 35
Let E be the event of getting a prize.
Number of outcomes favourable to event E = 10
P (E) = $\frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}=\frac{10}{35}=\frac{2}{7}$
Probability of getting a prize = $\frac{2}{7}$

19. $(a + b)^2 = a^2 + 2ab + b^2$

Here, a = 3 and b = -4

$$LHS = (a+b)^2 = (3-4)^2 = (-1)^2 = 1$$

$$RHS = a^2 + 2ab + b^2$$
$$= (3)^2 + 2(3)(-4) + (-4)^2$$
$$= 9 - 24 + 16$$
$$= 1$$

20. The generalized form is as below:

(i) $45 = 40 + 5$
$= 4 \times 10 + 5 \times 1$

(ii) $123 = 100 + 20 + 3$
$= 1 \times 100 + 2 \times 10 + 3 \times 1$

21. Since, volume of cuboid = $l \times b \times h$

Here, V = 800 cm^3, l = 20 cm and b = 10 cm

$$\Rightarrow 800 = 20 \times 10 \times h$$
$$\Rightarrow 800 = 200 \times h$$
$$\Rightarrow h = \frac{800}{200} = 4 \text{ cm}$$

22. We know that two quantities x and y vary directly if the ratio $\frac{x}{y}$ remains constant, so we find the ratio in each case.

x	5	7	9	11
y	15	21	36	33
Ratio $\frac{x}{y}$	$\frac{x}{y} = \frac{5}{15} = \frac{1}{3}$	$\frac{x}{y} = \frac{7}{21} = \frac{1}{3}$	$\frac{x}{y} = \frac{9}{36} = \frac{1}{4}$	$\frac{x}{y} = \frac{11}{33} = \frac{1}{3}$

Clearly, the ratio $\frac{x}{y}$ is not same for all the cases.

Thus, x and y are not varying directly.

23.

1.

$$\text{Cost of 1 pen} = \frac{12x^2 - 36x}{6x}$$
$$= \frac{12x^2}{6x} - \frac{36x}{6x}$$
$$= 2x - 6$$

Hence, the cost of one pen is Rs. (2x - 6).

24. Number of vertices (V) = 8
Number of edges (E) = 12
Let, number of faces = F
Since every polyhedron satisfy Euler's formula, therefore
F + V = E + 2
Or, F + 8 = 12 + 2
Or, F = 14 - 8 = 6
Hence, the number of faces is 6.

Section C

25. Let B's income be Rs. 100.
Then, A's income = Rs. 160
If A's income is Rs. 160, then B's income = Rs. 100.
If A's income is Rs 100, then B's income = Rs. $\left(\frac{100}{160}\times 100\right) = \text{Rs. } 62.50$
Therefore, B's income is less than A's income by (100 – 62.50)%, i.e. by 37.5%.

26. Converting 5.832 into fraction, we get $\frac{5832}{1000}$

2	5832
2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

Now,

$$\sqrt[3]{\frac{5832}{1000}}$$
$$= \frac{\sqrt[3]{5832}}{\sqrt[3]{1000}}$$
$$= \frac{\sqrt[3]{2\times 2\times 2\times 3\times 3\times 3\times 3\times 3}}{\sqrt[3]{2\times 2\times 2\times 5\times 5\times 5}}$$
$$= \frac{2\times 3\times 3}{2\times 5}$$
$$= \frac{18}{10}$$
$$= 1.8$$

27. Coins are cylindrical in shape.

Height (h_1) of cylindrical coins = 2 mm = 0.2 cm

Radius (r) of circular end of coins = $\frac{1.75}{2} = 0.875$ cm

Let n coins were melted to form the required cuboids.

Volume of n coins = Volume of cuboids

$\Rightarrow n \times \pi \times r^2 \times h_1 = l \times b \times h$

$\Rightarrow n \times \pi \times (0.875)^2 \times 0.2 = 5.5 \times 10 \times 3.5$

$\Rightarrow n = \frac{5.5 \times 10 \times 3.5 \times 7}{(0.875)^2 \times 0.2 \times 22}$

$\Rightarrow n = 400$

Hence, number of coins melted to form such cuboids is 400.

28. Let each of the two equal angles be x° .

x + x + 75° + 75° = 360° (sum of interior angles of a quadrilateral)

2x + 150° = 360°

2x = 360° - 150°

x = $\frac{210°}{2}$ = 105°

29. (5 – x) (6 – 5x)(2– x)

=(5 – x) [6(2 – x) – 5x(2 – x)]

=(5 – x) (12 – 6x – 10x + 5x^2)

=(5 – x) (12 – 16x + 5x^2)

=5 (12 – 16x + 5x^2) – x(12 – 16x + 5x^2)

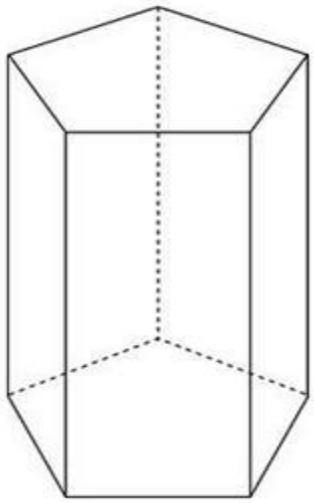
=60– 80x + 25x^2 – 12x – 16x^2 – 5x^3

=60– 92x + 41x^2 – 5x^3

30. Euler's Formula:

For a polyhedron having F number of faces, E number of edges and V number of vertices, we have F + V = E + 2.

The pentagonal prism looks like as shown below:



Here, the number of faces (F) = 7

Number of edges (E) = 15

The number of vertices (V) = 10

Now, F + V = 7 + 10 = 17

And, E + 2 = 15 + 2 = 17

Thus, F + V = E + 2

Hence, Euler's formula is verified

31. Suppose the price of the jeans is Rs. 100.
The 30% reduction on Rs. 100.
$d = 0.30 \times 100 = 30$
To get the first reduction price, subtract 30 from 100.
100 - 30 = 70
Now, take the 10% discount on Rs. 70.
0.10 × 70 = 7
Subtract 7 from 70.
70 - 7 = 63
So, the final price after both the reductions is Rs. 63.
To get the amount of change, subtract the old amount from the new amount.
63 - 100 = -37
Divide by the original amount.
$\frac{-37}{100} = -37\%$
So, the percent of decrease is 37%.
The reductions are different. If the jeans are first marked down 30%, and then reduced another 10%: this is only a 37% reduction, not a 40% reduction.

32.

(i) $x^0 \times y^0 \times z^0 = 1 \times 1 \times 1 = 1$

(ii) $\frac{(x^0 + y^0) \times 2^5}{2^4} = (1+1) \times 2^{5-4} = 2 \times 2^1 = 4$

(iii) $(4^6)^7 = 4^{6\times7} = 4^{42} = (2^2)^{42} = 2^{84}$

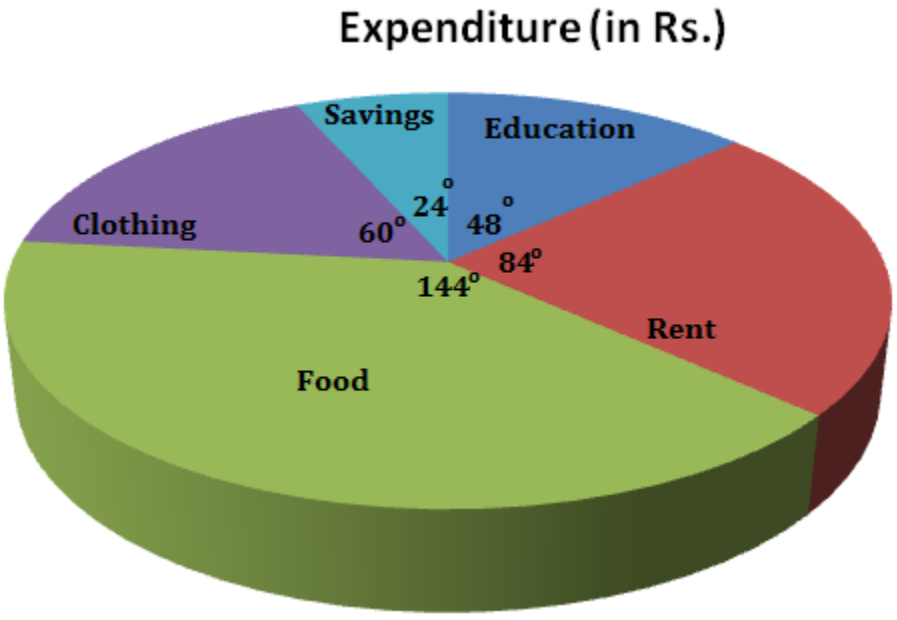
(iv)

$$\frac{a^2 \times a^3 \times b^3 \times b^4}{a^5 \times b^2}$$
$$= \frac{a^{2+3} b^{3+4}}{a^5 \times b^2}$$
$$= \frac{a^5 b^7}{a^5 \times b^2}$$
$$= a^{5-5} \times b^{7-2}$$
$$= a^0 \times b^5$$
$$= 1 \times b^5$$
$$= b^5$$

33.

Items	Expenditure (in Rs.)	**Measure of the central angle**
Education	2000	$\frac{2000}{15000}\times 360^\circ = 48^\circ$
Rent	3500	$\frac{3500}{15000}\times 360^\circ = 84^\circ$
Food	6000	$\frac{6000}{15000}\times 360^\circ = 144^\circ$
Clothing	2500	$\frac{2500}{15000}\times 360^\circ = 60^\circ$
Savings	1000	$\frac{1000}{15000}\times 360^\circ = 24^\circ$
Total	**15000**	**360°**

On the basis of table, the pie diagram is drawn:



34. The ratio of students who preferred blue to students who preferred red:
In Mrs. Valdez's class - 14:6
In Mrs. Kim's class, 8:5
We want to figure out which ratio is higher:

$\frac{14}{6}$ or $\frac{8}{5}$

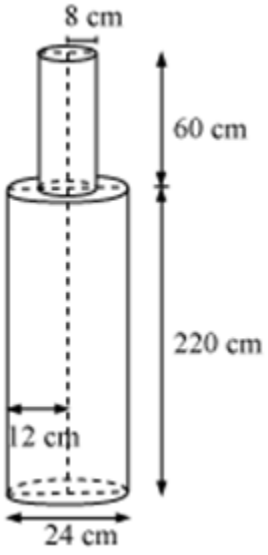
We can compare the ratios more easily by expressing them in percentage.
First, write the ratio as a decimal and then convert it to a percentage.
Thus,

$\frac{14}{6} = 2.33333 = 233.33\%$

And, $\frac{8}{5} = 1.6 = 160\%$

Comparing, we get 233.33% > 160%
Hence, Mrs. Valdez's class had a higher ratio of students who preferred blue to students who preferred red.

35. From the figure we have
Height (h_1) of larger cylinder = 220 cm
Radius (r_1) of larger cylinder = $\frac{24}{2}$ = 12 cm
Height (h_2) of smaller cylinder = 60 cm
Radius (r_2) of smaller cylinder = 8 cm
Total volume of pole = Volume of larger cylinder + Volume of cylinder



$$\text{Total volume of pole} = \pi r_1^2 h_1 + \pi r_2^2 h_2$$
$$= \pi(12)^2 \times 220 + \pi(8)^2 \times 60$$
$$= \pi[144 \times 220 + 6460]$$
$$= 35520 \times 3.14$$
$$= 1,11,532.8 cm^3$$

Mass of 1 cm^3 iron = 8 g
Mass of 111532.8 cm^3 iron = 111532.8 × 8 = 892262.4 g = 892.262 kg

36. The cost of 6 balls is Rs. 42.
We know that as the number of balls increases, the cost increases. Thus, they are directly proportional.
Let the cost of 10 balls, 15 balls and 20 balls be x, y, and z, respectively.

Quantity	6	10	15	20
Cost (in Rs)	42	x	y	z

In case of direct proportion, the ratio of the two quantities remains constant.

Therefore, $\frac{6}{42}=\frac{10}{x}=\frac{15}{y}=\frac{20}{Z}$

On solving, we get
x = 70
y = 105
z = 140
Thus, we have

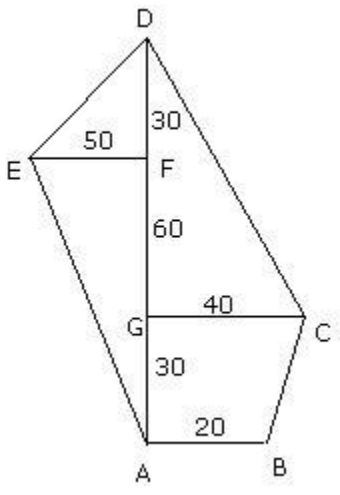
Quantity	10	15	20
Cost (in Rs.)	70	105	140

37. Area of polygon = Area of trapezium ABCG + Area of triangle GCD + Area of triangle DEF + Area of triangle EAF

Now,

$$\text{Area of trapezium ABCG}=\frac{1}{2}\times AG\times(AB+CG)$$
$$=\frac{1}{2}\times 30\times(20+40)$$
$$=\frac{1}{2}\times 30\times 60$$
$$=900\ m^2$$

$$\text{Area of triangle GCD}=\frac{1}{2}\times GC\times DG$$
$$=\frac{1}{2}\times 40\times(60+30)$$
$$=\frac{1}{2}\times 40\times 90$$
$$=1800\ m^2$$



$$\text{Area of triangle DEF} = \frac{1}{2} \times EF \times DF$$
$$= \frac{1}{2} \times 50 \times 30$$
$$= 750 \text{ m}^2$$

$$\text{Area of triangle EAF} = \frac{1}{2} \times EF \times FA$$
$$= \frac{1}{2} \times 50 \times (60 + 30)$$
$$= \frac{1}{2} \times 50 \times 90$$
$$= 2250 \text{ m}^2$$

Hence area of polygon = 900 + 1800 + 750 + 2250 = 5700 m^2.a