Goa Board
Class VII Mathematics
Sample Paper – 2 Solution

Time: 3 hours **Total Marks: 90**

Section A

1. Correct answer: B
   Negative of a negative integer is a positive integer.
   So, - (-5) = +5
   So, -2 - (-5) = -2 + 5

2. Correct answer: C
   $\angle 3 = \angle 1 + \angle 2$
   The measure of an exterior angle of a triangle is equal to the sum of measures of its two opposite interior angles.

3. Correct answer: C
   The given observations are 11, 10, 12, 12, 9, 10, 14, 12, 9.
   $\text{Mean} = \frac{11+10+12+12+9+10+14+12+9}{9} = \frac{99}{9} = 11$

4. Correct answer: A

5. Correct answer: C
   Angle x is alternate angle to angle 30^o.
   And, since alternate interior angles are equal, $x = 30^o$.

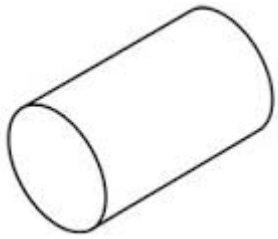
6. Correct answer: B
   $56\% = \frac{56}{100} = 0.56$

7. Correct answer: B
   For the option (B), 1 is the only common factor between numerator and denominator and the denominator is a positive integer, hence it is in the standard form.

8. Correct answer: D
   6 components - three angles and three sides.

9. Correct answer: A

Cylinder



10. Correct answer: C

$$\frac{16}{25} = \frac{2\times2\times2\times2}{5\times5} = \frac{2^4}{5^2}$$

11. Correct answer: C

The length of given cuboid is 6 units.

12. Correct answer: A

Perimeter of rhombus = 28 cm

Thus, 4 × (side) = 28 cm

Side = $\frac{28}{4}$ = 7 cm

Section B

13. In the figure, we can see that ∠POR and ∠ROT are right angles.

Thus, $\angle ROS + \angle 2 = 90^o$

$\angle ROS = 67^o$

So, $\angle 2 = 90^o - 67^o = 23^o$

Also, $\angle POQ + \angle 1 = 90^o$

$\angle POQ = 52^o$

So, $\angle 1 = 90^o - 52^o = 38^o$

14. $\frac{2x-1}{3}=\frac{x+2}{2}$

Multiply both sides by 6 (L.C.M of 3 and 2)

2 (2x -1) = 3 (x + 2)

4x - 2 = 3x + 6

Transpose 3x to L.H.S and -2 to R.H.S

4x -3x = 6 + 2

x = 8

15. Material required to make 1 shirt = $\frac{2}{5}$ yards

Material required to make 6 shirts = $\frac{2}{5}\times 6=\frac{2}{5}\times\frac{6}{1}=\frac{12}{5}$

Thus, to make 6 shirts, $\frac{12}{5}$ yards of material will be required.

16. Given, $\Delta CDE \cong \Delta QPR$

We have to find the angle in ΔPQR that corresponds to $\angle D$.

Now, since corresponding parts of congruent triangles are congruent, $\angle D \cong \angle P$.

Hence, $\angle D = 60^{o}$.

17. Percentage of marks scored by Rahul = $\frac{40}{50}\times 100=80\%$

Percentage of marks scored by Rohan = $\frac{75}{100}\times 100=75\%$

Hence, Rahul scored more marks than Rohan.

18. Required sum:

(6m - 7n - 5p) + (-4m - 9n + 6p) + (-4m - 9n + 6p)

= 6m - 7n - 5p - 4m - 9n + 6p - 4m - 9n + 6p

= (6m - 4m - 4m) + (-7n - 9n - 9n) + (-5p + 6p + 6p)

= (6 - 4 - 4)m + (-7 - 9 - 9)n + (-5 + 6 + 6)p

= -2m - 25n + 7p

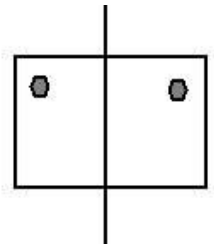
19.

(i) $\left(\frac{-7}{9}\right)^3=\frac{-7}{9}\times\frac{-7}{9}\times\frac{-7}{9}=\frac{-7\times-7\times-7}{9\times9\times9}$

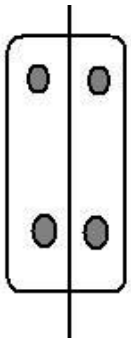
(ii) $\left(\frac{5}{8}\right)^3=\frac{5}{8}\times\frac{5}{8}\times\frac{5}{8}\times\frac{5}{8}\times\frac{5}{8}\times\frac{5}{8}=\frac{5\times5\times5\times5\times5\times5}{8\times8\times8\times8\times8\times8}$

20. The other holes are as shown below:

(i)



(ii)



Section C

21. Let the number of 50 paisa coins = x
Then, number of 25 paisa coins = 2x
Total money with Sumitra = Rs 34 = 34 × 100 paise = 3400 paise
From the given condition, we have:
$50x + 25 \times 2x = 3400$
$50x + 50x = 3400$
$100x = 3400$
$x = 34$
Number of 50 paisa coins = 34
Number of 25 paisa coins = $2 \times 34 = 68$

22. (1) 6 students got 80 marks.
(2) 4 students got 60 marks.
(3) Total number of students who took the test = 1 + 2 + 4 + 3 + 6 + 2 = 18

23. Given,
EV, FK and SG are the medians of triangle EFG
Thus K, V and S are the mid-points of EG, FG and EF, respectively.
Also, given that:
EG = 12 cm; FG = 10 cm; EF = 7 cm
Now, KG = $\frac{1}{2} \times EG = \frac{1}{2} \times 12 = 6\ cm$

FV = $\frac{1}{2} \times FG = \frac{1}{2} \times 10 = 5\ cm$

FS = $\frac{1}{2} \times EF = \frac{1}{2} \times 7 = 3.5\ cm$

Thus, the required lengths are
FS = 3.5 cm; KG = 6 cm; FV = 5 cm

24. Let the unknown number be n.
$\frac{1}{2}$ of $\frac{-3}{4}$ of n = 6

$\Rightarrow \frac{1}{2} \times \frac{-3}{4} \times n = 6$

$\Rightarrow \frac{-3}{8} \times n = 6$

$\Rightarrow n = 6 \times \frac{8}{-3}$

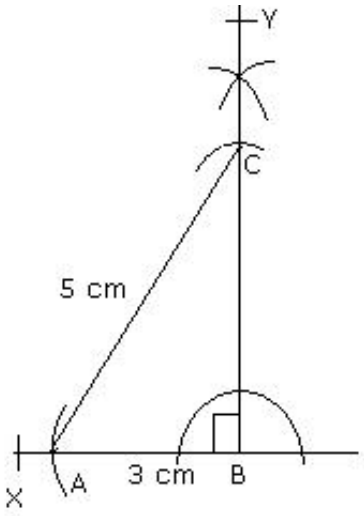
$\Rightarrow n = \frac{48}{-3} = -16$

Thus, the required number is -16.

25. Total students = 120
Number of girls = 40
Number of boys = 120 - 40 = 80
(a) Ratio of boys to girls = 80:40 = 2:1
(b) Ratio of boys to total students = 80:120 = 2:3
(c) Ratio of girls to total students = 40:120 = 1:3

26. Steps of construction:

1. Draw a line BX and BY such that BY is perpendicular on BX.
2. Taking radius 3 cm and centre B cut the line BX at A.
3. Taking radius 5 cm and centre A cut the line BY at C.
4. Join AC.
5. ABC is the required triangle.
6. Measure of side BC i.e. third side is 4 cm.



27. Given, radius of the outer circle = 12 cm

So, area of the outer circle = πr^2

$= 3.14 \times 12^2$

$= 452.16 \text{ cm}^2$

Radius of the inner circle = 7 cm

Area of the inner circle = πr^2

$= \frac{22}{7} \times 7^2 = 154 \text{ cm}^2$

Thus, the required area of the shaded portion

= Area of the outer circle - Area of the inner circle

= 452.16 - 154

$= 298.16 \text{ cm}^2$

28. Eggs produced by the poultry farm = 600
Eggs delivered to each shop = 600 ÷ 10 = 60
Money earned by a particular shopkeeper = Rs. 276
Money earned if all eggs were good = 60 × 5 = Rs. 300
Money lost due to rotten eggs = 300 - 276 = Rs. 24
Cost that shopkeeper will give for one rotten egg = Rs. 2
Number of rotten eggs = 24 ÷ 2 = 12
Hence, 12 eggs were rotten.

29. Area of a parallelogram = base × height

$$= 3\frac{1}{2}cm \times 1\frac{2}{7}cm$$

$$= \frac{7}{2} \times \frac{9}{7}$$

$$= \frac{9}{2}cm^2$$

$$= 4.5cm^2$$

Thus area of the paralleogram is $4.5cm^2$.

30. Mode is observation which appears most often.
Mode = y - 1
Median is the middle most value.
Median = 4^{th} observation = y + 4
Given, Mode + Median = 15
y - 1 + y + 4 = 15
2y + 3 = 15
2y = 12
y = 6

Section D

31.

$$5.75 - \frac{3}{7} \times 15\frac{3}{4} + 2\frac{2}{35} \div 1.44$$

$$= \frac{575}{100} - \frac{3}{7} \times \frac{63}{4} + \frac{72}{35} \div \frac{144}{100}$$

$$= \frac{575}{100} - \frac{3}{7} \times \frac{63}{4} + \frac{72}{35} \times \frac{100}{144}$$

$$= \frac{23}{4} - \frac{3}{7} \times \frac{63}{4} + \frac{10}{7}$$

$$= \frac{23}{4} - \frac{27}{4} + \frac{10}{7}$$

$$= -\frac{4}{4} + \frac{10}{7} = -1 + \frac{10}{7} = \frac{-7+10}{7} = \frac{3}{5}.$$

32. Given: AD=CD, $\angle 3 = \angle 4$

To Prove: DB bisects $\angle ABC$.

Proof:

$\angle 1 + \angle 3 = 180°$ ....(1)

$\angle 2 + \angle 4 = 180°$ ....(2)

From (1) and (2)

$\angle 1 + \angle 3 = \angle 2 + \angle 4$

Given $\angle 3 = \angle 4$;

Then we get $\angle 1 = \angle 2$

Also, DB = BD (common side)

AD = CD (given)

So $\Delta ABD \cong \Delta CBD$ (SAS congr.)

Thus $\angle 5 = \angle 6$ (c.pc.t.)

Hence DB bisects $\angle ABC$. (by property of bisectors.)

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

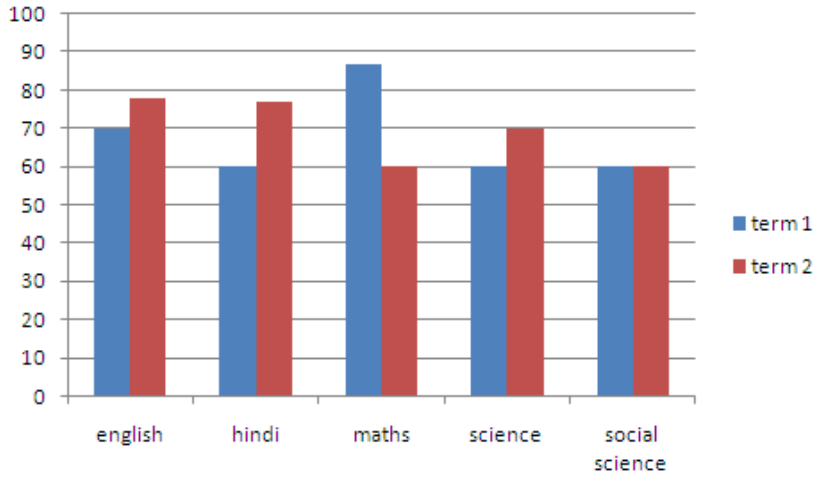
$= (-5)^{2\times4} \times \frac{1}{(-5)^{2\times3}}$

$= (-5)^8 \times \frac{1}{(-5)^6}$

$= (-5)^{8-6}$

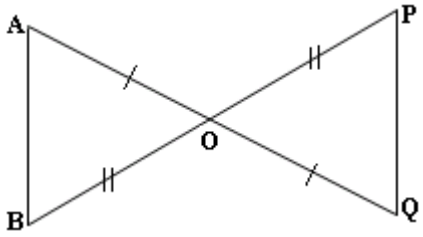
$= (-5)^2$

34. The double bar graph is as shown below:



35.

i) Is ΔOAB ≅ ΔOQP?



Solution: Yes

ii) Which pairs of matching parts have you used to answer (i).

Solution: OA = OQ

OB = OP

ΔAOB = ΔQOP

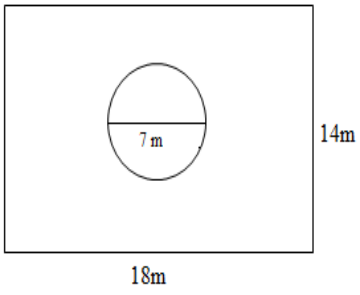
iii) Is AB = PQ?

Yes

iv) Can we say ΔOAB ≅ ΔOPQ?

No

36. In a rectangle, l = 18, b = 14m



Area of rectangle = l x b = 18 x 14 = 252 m^2

For the circular fountain, d = 7 m i.e. r = 3.5 m

Area of circular fountain = $\pi r^2 = \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2}$ = 38.5 m^2

Area of the lawn excluding the fountain = 252 – 38.5 = 213.5 m^2

37. In order to add the measure of solutions, the amount of liquid in each beaker must have same units. Since the measures of all the beakers do not have the same units, we convert liters into milliliters to make all the units similar.

We know that:-

1 liter = 1000 milliliters

So, 1.5553 liters = 1555.30 milliliters

And 0.6 liters = 600 milliliters

Now, adding all the measurements we get,

$$\begin{array}{r} {\scriptstyle 2\,1\,1\,1} \\ 640.60 \\ +\ 908.44 \\ +\ 1555.30 \\ \underline{+\ 600.00} \\ 3704.34 \end{array}$$

Thus, the chemist will get 3704.34 milliliters of solution after he mixes together the liquids in the beakers.

38.

$$CP=\left(\frac{100}{100+\text{gain}\%}\right)\times SP$$

Thus, CP of 1st transistor$=\left(\frac{100}{100+20}\right)\times 840=Rs.700$

Similarly,

C.P.of 2nd transistor$=\left(\frac{100}{96}\right)\times 960 = Rs.1000$

So, total C.P.=Rs.(700+1000) = Rs.1700

Total S.P. = Rs.(840+960) = Rs.1800

Gain = Rs.(1800-1700) = Rs.100

$$\text{Gain}\% = \left(\frac{100}{1700}\times 100\right)\% = \frac{100}{17} = 5\frac{15}{17}\%$$