CBSE Board
Class VII Mathematics
Term I
Sample Paper 1 - Solution

Time: 2 ½ hours Total Marks: 80

Section A

1. Correct answer: A
According to the distributive property of integers, we have
$a \times (b + c) = a \times b + a \times c$

2. Correct answer: B
A number is chosen from numbers 1 to 5.
Odd numbers are 1, 3, 5.
Required probability
= number of ways to choose an odd number /total number of numbers
= 3/5

3. Correct answer: A
$3x + 4 = 25$
Transposing 4 to R.H.S, we get
$3x = 25 - 4$
$3x = 21$
Dividing both sides by 3, we get
$x = 7$

4. Correct answer: D
Since, the angle measuring 150^o and y are corresponding angles. Therefore, $y = 150^o$.
(As the lines are parallel, corresponding angles are equal)

5. Correct answer: D
We know that the measure of an exterior angle of a triangle is equal to the sum of its two opposite interior angles.
So, $x + 90^o = 125^o$
Therefore, $x = 35^o$

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

7. Correct answer: C

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

Since, the measure of an exterior angle of a triangle is equal to the sum of measures of its two opposite interior angles.

8. Correct answer: C

The given observations are 11, 10, 12, 12, 9, 10, 14, 12, 9.

$\text{Mean} = \frac{11+10+12+12+9+10+14+12+9}{9} = \frac{99}{9} = 11$

9. Correct answer: A

Let the number = x

One third of the number= $\frac{1}{3}x$

Five added to a one third of the number = $5 + \frac{1}{3}x$

From the given condition, we have:

$5 + \frac{1}{3}x = 2x$

$5 = 2x - \frac{1}{3}x$

$5 = \frac{6x - x}{3}$

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

$x = 3$

10. Correct answer: C

Angle x is alternate angle to angle 30^o.

And, since alternate interior angles are equal, $x = 30^o$.

11. Correct answer: C

Since, given triangle is a right angled triangle, we have

$x^2 = 3^2 + 4^2 = 9 + 16 = 25 = 5^2$

Therefore, x = 5 cm

12. Correct answer: B

Given, AB = RQ, AC = RP, $\angle BAC = \angle QRP$

Hence, $\Delta ABC \cong \Delta RQP$

Section B

13. To find the complement of each of the given angle, we have to subtract them from 90^o, since the sum of two complementary angles is 90^o.

(a) Complementary angle of $45^o = 90^o - 45^o = 45^o$

(b) Complementary angle of $54^o = 90^o - 54^o = 36^o$

(c) Complementary angle of $65^o = 90^o - 65^o = 25^o$

14.

(a) $6n + 4 = 10$

Statement:

For 6n, Six times of a number n

For 6n + 4, Six times of a number n added to 4

Thus, for 6n + 4 = 10, the final statement is

"Six times of a number n added to 4 gives 10".

(b) $\frac{y}{7} - 3 = 9$

Statement:

For $\frac{y}{7}$, one-seventh of a number y

For $\frac{y}{7} - 3$, 3 subtracted from one-seventh of a number y

Thus, for $\frac{y}{7} - 3 = 9$, the final statement is

"3 subtracted from one-seventh of a number y gives 9".

15. $\frac{2}{4}$ part of the exercise is solved by Raju.

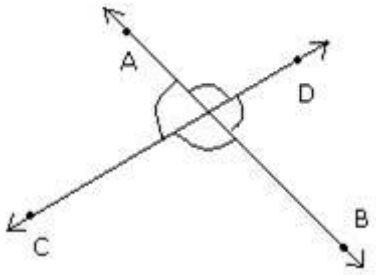
When $\frac{2}{4}$ is converted into lowest form, we get

$$\frac{2}{4} = \frac{2 \div 2}{4 \div 2} = \frac{1}{2}$$

which is same as part of exercise solved by Sameer.

Thus, both have solved same part of the exercise.

16. When two line intersect the following figure is formed. This shows that 4 angles are formed.



17. Divide the total length of ribbon by the length of each strip of ribbon that is cut from it to get the total number of ribbon strips.

So, divide $7\frac{1}{2}$ by $1\frac{1}{4}$

$= 7\frac{1}{2} \div 1\frac{1}{4}$

$= \frac{15}{2} \div \frac{5}{4}$

$= \frac{15}{2} \times \frac{4}{5}$

$= \frac{3}{1} \times \frac{2}{1} = \frac{3 \times 2}{1} = \frac{6}{1} = 6$

Thus, 6 strips can be cut from the ribbon.

18. In the figure, we can see that $\angle$POR and $\angle$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, $\angle 1 = 90^o - 52^o = 38^o$

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

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

20. 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.

21. 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.

22. 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, $\angle D = 60^o$.

23. Average score = mean score

$$\text{Mean} = \frac{\text{Sum of all the observations}}{\text{Total number of observations}}$$

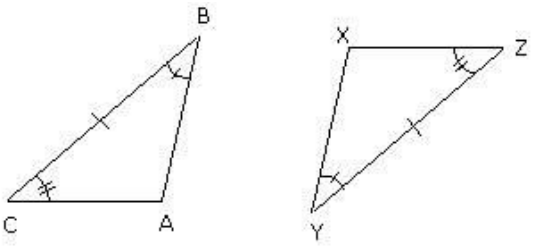
$$= \frac{12+23+10+77+15+78+90+54+23+10+1}{11}$$

$$= \frac{393}{11} = 35.7$$

24. ASA congruence criterion:

The Angle Side Angle (ASA) postulate states that, if under a correspondence, two angles and the included side of a triangle is equal to two corresponding angles and the included side of another triangle, then the two triangles are congruent.

Consider the triangles ABC and XYZ, as shown below.



Two angles and the included side are congruent.

$\angle ABC = \angle XYZ$ (equal angle)

BC = YZ (equal side)

$\angle ACB = \angle XZY$ (equal angle)

So, $\triangle ABC \cong \triangle XYZ$

Therefore, by the ASA congruence criterion, the triangles are congruent.

Section C

25.

(1) Sales of branch B2 for both years = 75 + 65 = 140

Sales of branch B4 for both years = 85 + 95 = 180

Required ratio = $\frac{140}{180} = \frac{7}{9} = 7:9$

(2) Average sales of all the six branches (in thousand numbers) for the year 2000

$= \frac{1}{6} \times (80+75+95+85+75+70) = 80$

(3) Total sales of branch B6 for both the years = 70 + 80 = 150

Total sales of branch B3 for both the years = 95 + 110 = 205

Required percentage = $\left(\frac{150}{205} \times 100\right)\% = 73.17\%$

26. Since, ADB is a right-angled triangle.

$AD^2 + BD^2 = AB^2$

$AD^2 + BD^2 = AC^2$ [given, AB = AC]

$AD^2 + BD^2 = (AD + CD)^2$

$AD^2 + BD^2 = AD^2 + CD^2 + 2AD.CD$

[Subtract AD^2 from both sides]

$BD^2 = CD^2 + 2AD.CD$

[Subtract CD^2 from both sides]

$BD^2 - CD^2 = 2AD.CD$

Thus, $BD^2 - CD^2 = 2AD.CD$

27. Given that, both the figures are congruent.
Corresponding sides:
OP $\leftrightarrow$WX; OR $\leftrightarrow$UX; QR $\leftrightarrow$UV; QP $\leftrightarrow$VW
Corresponding vertices:
O $\leftrightarrow$X; P $\leftrightarrow$W; Q $\leftrightarrow$V; R $\leftrightarrow$U
Corresponding angles:
$\angle O \leftrightarrow \angle X$; $\angle P \leftrightarrow \angle W$; $\angle Q \leftrightarrow \angle V$; $\angle R \leftrightarrow \angle U$

28. 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 × 2x = 3400
50x + 50x = 3400
100x = 3400
x = 34
Number of 50 paisa coins = 34
Number of 25 paisa coins = 2 × 34 = 68

29. Given that,
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

30. Let the third side = x
Two equal sides are 2x - 5, 2x - 5
Perimeter = Sum of all sides = 55 m
i.e., x + 2x - 5 + 2x - 5 = 55
5x - 10 = 55
5x = 55 + 10
5x = 65
x = 13
Two equal sides = 2x - 5 = 2 × 13 - 5 = 26 - 5 = 21
Thus, the lengths of three sides are 13 m, 21 m and 21 m

31. Distance travelled with 1 gallon = $10\frac{2}{3} = \frac{32}{3}$ miles

Distance travelled with $5\frac{1}{2} = \frac{11}{2}$ gallons

$$= \frac{11}{2} \times \frac{32}{3} \text{ miles}$$

$$= \frac{11}{1} \times \frac{16}{3} \text{ miles}$$

$$= \frac{11 \times 16}{3} \text{ miles}$$

$$= \frac{176}{3} \text{ miles}$$

Thus, Sam can go $\frac{176}{3}$ miles with $\frac{11}{2}$ gallons.

32. Median is the middle most value.

Median = 4^{th} observation = $2x + 9$

$2x + 9 = 29$

$2x = 20$

$x = 10$

We have to find

$[(3x - y + z) + (-y - z)] - (3x - y - z)$

$= [3x - y + z - y - z] - (3x - y - z)$

$= (3x - 2y) - (3x - y - z)$

$= 3x - 2y - 3x + y + z$

$= 3x - 3x - 2y + y + z$

$= -y + z$

Section D

33. Total number of balls = 12

It is also given that the bag contains an equal number of balls of each of the four colours: yellow, blue, green and red.

Therefore,

Number of yellow balls = Number of blue balls = Number of green balls = Number of red balls = 3

$$P(\text{yellow}) = \frac{\text{Number of yellow balls}}{\text{Total number of balls}} = \frac{3}{12} = \frac{1}{4}$$

$$P(\text{blue}) = \frac{\text{Number of blue balls}}{\text{Total number of balls}} = \frac{3}{12} = \frac{1}{4}$$

$$P(\text{green}) = \frac{\text{Number of green balls}}{\text{Total number of balls}} = \frac{3}{12} = \frac{1}{4}$$

$$P(\text{red}) = \frac{\text{Number of red balls}}{\text{Total number of balls}} = \frac{3}{12} = \frac{1}{4}$$

34. 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

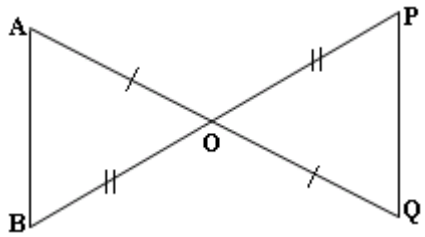
And 0.6 liters = 600 milliliters

Now, adding all the measurements we get,

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

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

35.



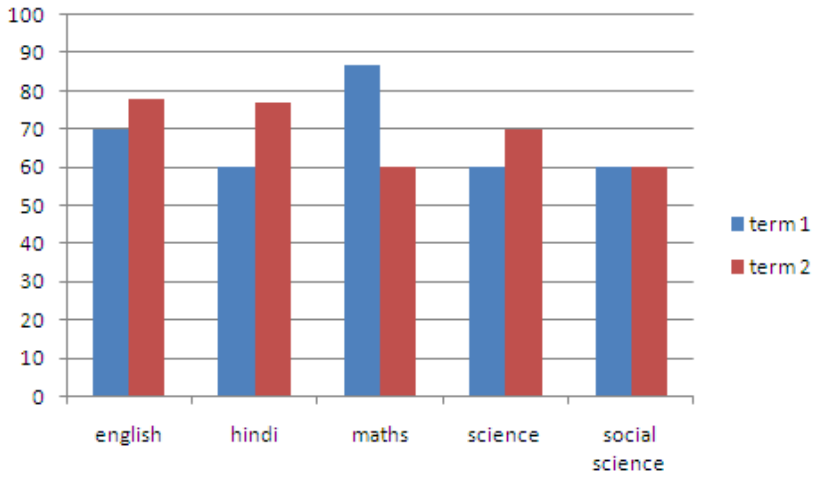
i) Is $\Delta OAB \cong \Delta OQP$?
   Solution: Yes

ii) Which pairs of matching parts have you used to answer (i).
   Solution: OA = OQ
   OB = OP
   $\Delta AOB = \Delta QOP$

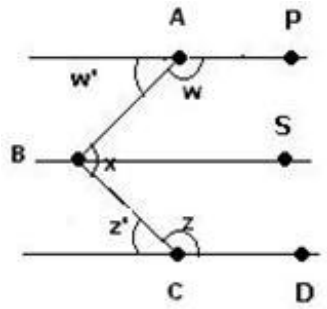
iii) Is AB = PQ?
   Yes

iv) Can we say $\Delta OAB \cong \Delta OPQ$?
   No

36. The double bar graph is as shown below:



37. Draw BS parallel to AP and CD as shown in the figure below.



$\angle ABC = \angle ABS + \angle CBS$

$\angle w'$ and $\angle ABS$ are alternate interior angles So, $\angle ABS = \angle w'$

$\angle z'$ and $\angle CBS$ are alternate interior angles So, $\angle CBS = \angle z'$

Angles w and w' are supplementary which gives $w' = 180^o - w = 180^o - 135^o = 45^o$

Angles z and z' are also supplementary which gives $z' = 180^o - z = 180^o - 147^o = 33^o$

Therefore, we have:

$\angle ABC = \angle ABS + \angle CBS$

$\angle ABC = w' + z' = 45^o + 33^o = 78^o$