CBSE Board
Class VII Mathematics
Term I
Sample Paper 2 - Solution

Time: 2 ½ hours Total Marks: 80

Section A

1. Correct answer: C

-5 + 9 + (-5) + (-10) + (1)

-5 + 9 = 4

4 + (-5) = -1

-1 + (-10) = -1 - 10 = -11

-11 + 1 = -10

So, -5 + 9 + (-5) + (-10) + (1) = -10

2. Correct answer: B

$$0.2 \times 0.2 = \frac{2}{10} \times \frac{2}{10} = \frac{4}{100} = 0.04$$

3. Correct answer: B

Since 11 has highest frequency, the mode is 11.

4. Correct answer: B

The given equation can be written in the form of statement as "One third of p is q".

5. Correct answer: D

There are 3 acute angles, ∠AOB, ∠BOC and ∠AOC.

6. Correct answer: A

In triangles ABC and PQC, we have:

AB = PQ

BC = CQ

∠B = ∠Q

Thus, triangles ABC and PQC are congruent.

Therefore, ∠BAC = ∠CPQ

Now, applying angle sum property in triangle ABC, we get,

∠BAC = $180^o - 70^o - 30^o = 80^o$

Therefore, ∠CPQ = 80^o

7. Correct answer: A

25×-99 can be written as $25 \times (-100 + 1)$

Using distributive property of integers we can write

$25 \times (-100+1) = 25 \times (-100) + 25 \times 1$

8. Correct answer: D

$12.543 \div 100 = \frac{12543}{1000} \times \frac{1}{100} = \frac{12543}{100000} = 0.12543$

Thus, each part equals 0.12543.

9. Correct answer: C

Let the whole number be x.
Twice of the whole number = 2x
9 added to twice of the whole number = 9 + 2x
From the given information, we have:
9 + 2x = 31
2x = 31 - 9
2x = 22
x = 11
Thus, the required whole number is 11.

10. Correct answer: D

Measure of one right angle = 90°
Measure of one straight angle = 180°
Difference = $180^\circ - 90^\circ = 90^\circ$

11. Correct answer: A

The two triangles can be proved to be congruent by using SAS congruency criterion.
The corresponding equal parts in triangles ABC and ADE are
$AB = AD$; $BC = DE$; $\angle B = \angle D$

12. Correct answer: A

2x + 3 = 7
If we will transpose 3 to RHS, the term with variable will remain on one side and the constants will be on other side.
So, first step is to Transpose 3 to RHS.
i.e., 2x = 7 – 3

Section B

13. Total number of balls = 12

It is also given that the bag contains 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(yellow) = $\frac{\text{Number of yellow balls}}{\text{Total number of balls}} = \frac{3}{12} = \frac{1}{4}$

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

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

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

14. Let the number be x

Then, Three fifth of a number = $\frac{3}{5}$x

5 added to three-fifth of a number = 5 + $\frac{3}{5}$x

Thus, the linear equation will be

$$5 + \frac{3}{5}x = \frac{14}{3}$$

Solving the linear equation to find x.

Transposing 5 to R.H.S., we get

$$\frac{3}{5}x = \frac{14}{3} - 5$$

$$\frac{3}{5}x = \frac{14-15}{3}$$

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

Multiplying both sides with $\frac{5}{3}$, we get

$$x = \frac{5}{3} \times \frac{-1}{3} = \frac{-5}{9}$$

Thus, the required number is $\frac{-5}{9}$.

15. Given: a = -8, b = -7, c = 6

(a+ b) + c = [(-8) + (-7)] + 6 = -15 + 6 = -9

a + (b + c) = (-8) + [(-7) + 6] = -8 - 1 = -9

Hence, (a + b) + c = a + (b + c).

16. First, we need to line up the decimals as follows:

3.25 = 3.250

0.075 = 0.075

5 = 5.000

Now, adding them gives

  3.250
+ 0.075
+ 5.000
  8.325

17. We know that the sum of two sides of a triangle is always greater than the third.

The given lengths of the sides are 5 cm, 3 cm, 4 cm.

Let us check whether the above stated property holds true. We have:

5 + 3 = 8, which is greater than 4

5 + 4 = 9, which is greater than 3

3 + 4 = 7, which is greater than 5

Thus, it is possible to draw a triangle with given side lengths.

18. Given that, m||p and t is the transversal

We know that, if two parallel lines are cut by a transversal, each pair of alternate interior angles are equal.

So, $\angle a = \angle z$ (pair of alternate interior angles)

Thus, $\angle z = 57^{\circ}$

19. The numbers in ascending order are:

11, 12, 12, 12, 19, 23, 33, 34, 34, 45, 46, 49, 50, 55, 56, 65, 67, 78, 81, 87, 98

As the number of observations (21) are odd,

Median = middle observation = 11^{th} observation = 46

Mode is the observation that appears most often.

Here, 12 appears maximum number of times (thrice). So, 12 is the mode.

20. 725 × (-35) + (-725) × 65

= 725 × (-35) - 725 × 65

= 725 x (-35 - 65)   [Using distributive property]

= 725 × (-100)

= -72500

21. Time taken by Mala to drink a glass of milk = $\frac{7}{8}$ mins

Time taken by Varun to drink a glass of milk = $\frac{9}{16}$ mins

To compare both the fractions, we have to change them into like fractions.

$\frac{7}{8} = \frac{7 \times 2}{16} = \frac{14}{16}$; $\frac{9}{16} = \frac{9 \times 1}{16} = \frac{9}{16}$

Since, 14 > 9, $\frac{7}{8} > \frac{9}{16}$

Thus, Mala took longer time to finish the glass of milk.

Now, we have to subtract the time durations of Mala and Varun to calculate how slow was Mala than Varun.

$= \frac{14}{16} - \frac{9}{16}$

$= \frac{14 - 9}{16}$

$= \frac{5}{16}$ mins

Thus, Mala took $\frac{5}{16}$ mins more than Varun to finish a glass of milk.

22. Sum of 38 and -87 = 38 + (-87) = 38 - 87 = -49

Subtracting (-134) from -49, we get

-49 - (-134) = -49 + 134 = 85

23. Pie filling made in 1 minute = 9.2 kg

Pie filling made in 6 minutes = 6 x 9.2 kg = 55.2 kg

24.

(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) $\frac{\ }{7}$ - 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'.

Section C

25. Here, ∠TOJ and ∠VOJ are linear pair of angles

So, ∠TOJ + ∠VOJ = 180^o

∠TOJ = $3x^o$; ∠VOJ = $(2x + 10)^o$

$3x^o + (2x + 10)^o = 180^o$

$(3x + 2x)^o + 10^o = 180^o$

$5x^o + 10^o = 180^o$

$5x^o = 170^o$

$x^o = 34^o$

26. $5.75 - \frac{3}{7} \times 15\frac{3}{4} + 2\frac{2}{35} \div 1.44$

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

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

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

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

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

27. Let Rahul's and Karan's age be 7x and 5x respectively.
After 10 yrs, their ages are 7x + 10, 5x + 10 respectively.
As per the given condition, Ratio after 10 years is 9 : 7

So, $\frac{7x+10}{5x+10}=\frac{9}{7}$

Cross Multiplying, we get
7(7x + 10) = 9(5x + 10)
49x + 70 = 45x + 90
4x = 20
x = 5
Therefore, Rahul's age = 7 × 5 = 35 years and Karan's age = 5 × 5 = 25 years

28. According to the given figure, we get
$x + 58^o = 180^o$ (linear pair angles)
$x + 58^o - 58^o = 180^o - 58^o$ (subtract 58^o from both sides)
$x = 122^o$
Also, $y + 60^o + 58^o = 180^o$ (angle sum property of a triangle)
$y + 118^o = 180^o$
$y = 62^o$ (subtracting 118^o from both sides)
Thus, $x = 122^o$, $y = 62^o$

29. Given: $AD \perp BC$, $BE \perp AC$ and AD = BE
To prove: AE = BD
Proof: $\angle ADB = \angle BEA$ (right angles)
AB = AB (common)
AD = BE (given)
Thus, $\Delta ABD \cong \Delta BAE$ (By RHS congruence rule).
Hence, BD = AE (Since, corresponding parts of congruent triangles are equal)

30.

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

31. 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.

32. Mode is observation which appears most often.

Mode = y – 1

Median is the middle most value.

Median = 4th observation = y + 4

Given, Mode + Median = 15

y - 1 + y + 4 = 15

2y + 3 = 15

2y = 12

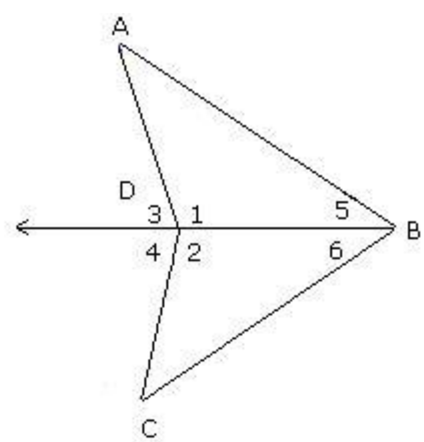
y = 6

Section D

33. Given: AD = CD

$\angle 3 = \angle 4$ ... (1)

To prove: DB bisects $\angle ABC$



Proof:

$\angle 1 + \angle 3 = 180^o$ (Linear pair) ... (2)

$\angle 2 + \angle 4 = 180^o$ (Linear pair) ... (3)

From (2) and (3),

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

Using (1), we have $\angle 1 = \angle 2$

Also, DB = DB (common side)

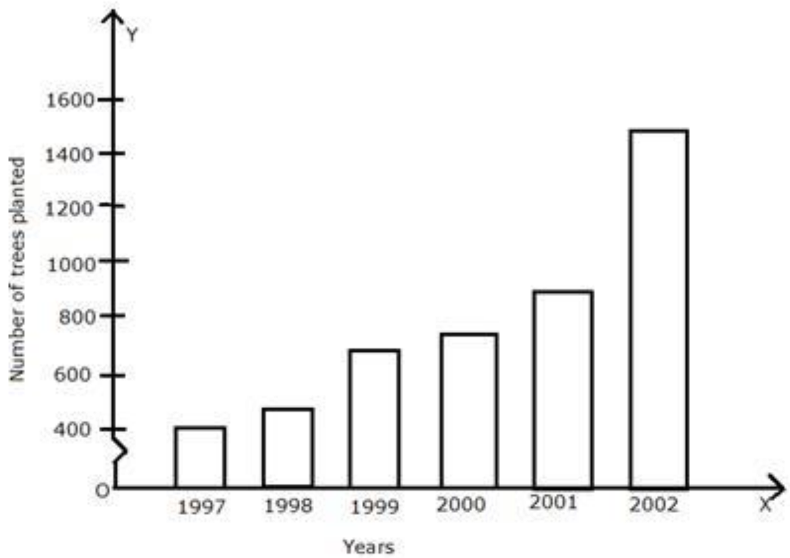
AD = CD (Given)

So, $\Delta ABD \cong \Delta CBD$ (By SAS congruence rule)

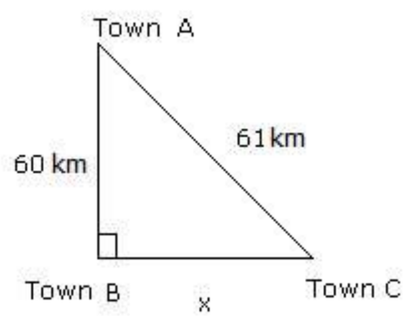
Thus, $\angle 5 = \angle 6$ (Corresponding parts of congruent triangles are congruent)

Hence, DB bisects $\angle ABC$.

34. **Step 1:** We draw two perpendicular lines OX and OY.
Step 2: On OX, we represent years, from 1997-2002 and on OY, we represent the number of trees planted.
Step 3: On OY, we start with 400 and mark points at equal intervals of 200.
Step 4: The height of the bars are calculated according to the number of trees. A kink (~) has been shown on the vertical axis showing that the marking on the vertical axis starts from zero but has been shown to start from 400 as the data needs.



35. We can show the diagram as below:



Let the road that connects towns B and C be x.
Applying Pythagoras theorem, we get
h = 61, b = x and p = 60
$p^2 + b^2 = h^2$
$60^2 + x^2 = 61^2$
$3600 + x^2 = 3721$ (subtract 3600 from both sides)
$x^2 = 121$
Thus, x = 11
Length of the road that connects towns B and C is 11 km.

36. Calculation is as follows:

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

As the number of observations are odd (5)

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th} = \left(\frac{5+1}{2}\right)^{th} = 3^{rd} \text{ observation}$$

Mode = Most occurring value

For India,

$$\text{Thus, Mean} = \frac{35+25+30+19+19}{5} = \frac{128}{5} = 25.6$$

Arranging data in ascending order: 19, 19, 25, 30, 35

Thus, Median = 3^{rd} observation = 25

Mode = 19 (occurring twice)

Team	Goals	Goals	Goals	Goals	Goals	Mean	Median	Mode
India	35	25	30	19	19	25.6	25	19
Sri Lanka	45	25	14	13	14	22.2	14	14
China	32	18	14	21	21	21.2	21	21

37. We have to first solve the bracket terms and then check for any common factors between the numerator and the denominator and then cancel them out.

(a) $\frac{-15}{35} \times \left(\frac{27}{-63} \div \frac{81}{14}\right) = \frac{-15}{35} \times \left(\frac{27}{-63} \times \frac{14}{81}\right)$

$= \frac{-15}{35} \times \left(\frac{1}{-9} \times \frac{2}{3}\right)$

$= \frac{-15}{35} \times \left(\frac{2}{-27}\right)$

$= \frac{-3}{7} \times \frac{-2}{27}$

$= \frac{-1}{7} \times \frac{-2}{9}$

$= \frac{2}{63}$

(b) $\left(\frac{-2}{-72} \div \frac{4}{9}\right) \div \frac{-6}{14} = \left(\frac{2}{72} \times \frac{9}{4}\right) \div \frac{-6}{14}$

$= \left(\frac{1}{8} \times \frac{1}{2}\right) \div \frac{-6}{14}$

$= \frac{1}{16} \div \frac{-6}{14}$

$= \frac{1}{16} \times \frac{-14}{6}$

$= \frac{1}{8} \times \frac{-7}{6}$

$= \frac{-7}{48}$