

**CBSE Board**  
**Class VII Mathematics**  
**Term I**  
**Sample Paper 3 - Solution**

Time: 2 ½ hours

Total Marks: 80

---

**Section A**

1. Correct answer: A

$$\begin{aligned}(128 \div 32) \div (-4) \\ = 4 \div (-4) \\ = -1\end{aligned}$$

2. Correct answer: A

$$\begin{aligned}\text{Total cost} &= 2.40 \times 10 \\ &= \text{Rs. } 24\end{aligned}$$

3. Correct answer: B

The given observations can be arranged in ascending order as  
4, 6, 9, 10, 11, 12 and 18  
Here, number of observations = 7 (odd)  
Median = Middle observation = 10

4. Correct answer: A

$$2x + 3 = 7$$

If we will transpose 3 to RHS, then the term with variable will remain on one side and the constants will be on other side.

So, the first step is to transpose 3 to RHS.

$$\text{i.e. } 2x = 7 - 3$$

5. Correct answer: C

$$\angle BCA = 180^\circ - 150^\circ = 30^\circ$$

(linear pair angles)

$$\text{Also, } \angle B = \angle BCA = 30^\circ$$

(Angles opp. to equal sides are equal)

$$\Rightarrow \angle A = 180^\circ - 30^\circ - 30^\circ = 120^\circ$$

(Using angle sum property of triangle)

6. Correct answer: B

Increased amount =

$$\text{Rs. } \frac{12}{100} \times 54 = \text{Rs. } 6.48$$

7. Correct answer: C

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

So the multiplicative inverse is  $\frac{3}{8}$ .

8. Correct answer: D

The triangle ABC is a right angled triangle,  
By Pythagoras theorem, we have:  $c^2 = a^2 + b^2$

9. Correct answer: B

$$\begin{aligned} 21b - 32 + 7b - 20b \\ = 21b + 7b - 20b - 32 \\ = 8b - 32 \end{aligned}$$

10. Correct answer: D

$$\begin{aligned} \text{Measure of one right angle} &= 90^\circ \\ \text{Measure of one straight angle} &= 180^\circ \\ \text{Difference} &= 180^\circ - 90^\circ = 90^\circ \end{aligned}$$

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: 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.

## Section B

13. Given that,  $m \parallel p$  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,  $\angle z = 57^\circ$ .

14. 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<sup>th</sup> observation = 46

Mode is the observation that appears most often.

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

15.  $725 \times (-35) + (-725) \times 65$

$$= 725 \times (-35) - 725 \times 65$$

$$= 725 \times (-35 - 65) \quad [\text{Using distributive property}]$$

$$= 725 \times (-100)$$

$$= -72500$$

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

Subtracting (-134) from -49, we get

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

17. Average score = mean score

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

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

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

$$= 35.7$$

18. Pie filling made in 1 minute = 9.2 kg

$$\text{Pie filling made in 6 minutes} = 6 \times 9.2 \text{ kg} = 55.2 \text{ kg}$$

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

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

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

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

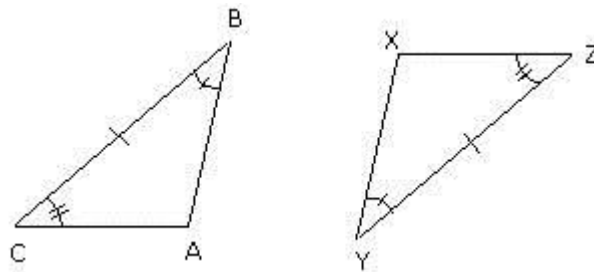
$$= \frac{176}{3} \text{ miles}$$

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

20. ASA congruence criterion:

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

$$\angle ABC = \angle XYZ \text{ (equal angle)}$$

$$BC = YZ \text{ (equal side)}$$

$$\angle ACB = \angle XZY \text{ (equal angle)}$$

$$\text{So, } \triangle ABC \cong \triangle XYZ$$

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

21. Let A and B be the two numbers such that,

$$40\% \text{ of } A = \frac{2}{3}B$$

Then,

$$\frac{40A}{100} = \frac{2B}{3}$$

$$\Rightarrow \frac{2A}{5} = \frac{2B}{3}$$

$$\Rightarrow \frac{A}{B} = \left( \frac{2}{3} \times \frac{5}{2} \right) = \frac{10}{3}$$

$$\therefore A:B = 5:3$$

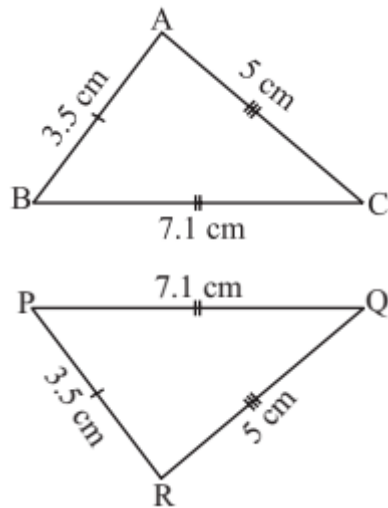
22. Here,  $AB = PR (= 3.5 \text{ cm})$ ,

$BC = PQ (= 7.1 \text{ cm})$

And  $AC = QR (= 5 \text{ cm})$

This shows that the three sides of one triangle are equal to the three sides of the other triangle. So, by SSS congruence rule, the two triangles are congruent. From the above three equality relations, it can be easily seen that  $A \leftrightarrow R$ ,  $B \leftrightarrow P$  and  $C \leftrightarrow Q$ .

So, we have  $\triangle ABC \cong \triangle RPQ$



23. Adding 5 on both sides of the equation,

$$12p - 5 + 5 = 25 + 5 \text{ or } 12p = 30$$

Dividing both sides by 12,

$$\frac{12p}{12} = \frac{30}{12} \text{ or } p = \frac{5}{2}$$

Check Putting  $p = \frac{5}{2}$  in the LHS of equation,

$$\begin{aligned} \text{LHS} &= \frac{5}{2} \times 12 - 5 = 6 \times 5 - 5 \\ &= 30 - 5 = 25 = \text{RHS} \end{aligned}$$

24. For ASA congruence rule, we need the two angles between which the two sides BC and RP are included. So, the additional information is as follows:

$$\angle B = \angle R \text{ and } \angle C = \angle P$$

### Section C

25. In the given figure,  $\angle BAC = 90^\circ$  and  $\angle ABC = 52^\circ$

Thus, using angle sum property of triangle, we get

$$\angle ABC + \angle BAC + y = 180^\circ$$

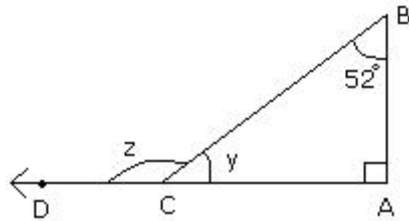
$$\Rightarrow 52^\circ + 90^\circ + y = 180^\circ$$

$$\Rightarrow 142^\circ + y = 180^\circ$$

$$y = 38^\circ$$

Now using exterior angle property, we get

$$z = \angle ABC + \angle BAC = 52^\circ + 90^\circ = 142^\circ$$



26. Let the distance travelled towards north be denoted by a positive sign.

So, the distance travelled towards south would be denoted by negative sign.

Thus, distance travelled by Rahul from A is given by:

$$\begin{aligned}\frac{2}{5} + \left(-1\frac{1}{2}\right) &= \frac{2}{5} + \left(\frac{-3}{2}\right) \\ &= \frac{2 \times 2}{5 \times 2} + \left(-\frac{3 \times 5}{2 \times 5}\right) \\ &= \frac{4}{10} + \left(-\frac{15}{10}\right) \\ &= \frac{4 - 15}{10} = \frac{-11}{10} = -1\frac{1}{10}\end{aligned}$$

Since it is negative, it means Rahul is at a distance of  $1\frac{1}{10}$  km towards south of point A.

27. Eggs produced by the poultry farm = 600

Eggs delivered to each shop =  $600 \div 10 = 60$

Money earned by a particular shopkeeper = Rs. 276

Money earned if all eggs were good =  $60 \times 5 = \text{Rs. } 300$

Money loosed due to rotten eggs =  $300 - 276 = \text{Rs. } 24$

Cost that shopkeeper will give for one rotten egg = Rs. 2

Number of rotten eggs =  $24 \div 2 = 12$

Hence, 12 eggs were rotten.

28. (i) Arranging the ages in ascending order, we get:

23, 26, 28, 32, 33, 35, 38, 40, 41, 54

We find that the age of the oldest teacher is 54 years and the age of the youngest teacher is 23 years.

(ii) Range of the ages of the teachers =  $(54 - 23)$  years = 31 years

(iii) Mean age of the teachers

$$\begin{aligned}&= \frac{23 + 26 + 28 + 32 + 33 + 35 + 38 + 40 + 41 + 54}{10} \text{ years} \\ &= 35 \text{ years}\end{aligned}$$

Raju's age is  $3y$  years. Raju's father's age is 5 years more than  $3y$ ; that is, Raju's father is  $(3y + 5)$  years old. It is also given that Raju's father is 44 years old.

Therefore,  $3y + 5 = 44$

This is an equation in  $y$ . It will give Raju's age when solved.

30. We know that the sum of two sides of a triangle is always greater than the third. Therefore, third side has to be less than the sum of the two sides. The third side is thus, less than  $8 + 6 = 14$  cm. The side cannot be less than the difference of the two sides. Thus, the third side has to be more than  $8 - 6 = 2$  cm. The length of the third side could be any length greater than 2 and less than 14 cm.

31. Principal,  $P = \text{Rs. } 12500$   
Amount,  $A = \text{Rs. } 15500$   
Thus, S.I. = Rs.  $(A - P) = \text{Rs. } (15,500 - 12,500) = \text{Rs. } 3,000$ .

$$\text{Rate} = \left( \frac{100 \times \text{Simple Interest}}{\text{Principal} \times \text{Time}} \right) \%$$

$$\text{Rate} = \left( \frac{100 \times 3000}{12500 \times 4} \right) \%$$

$$\text{Rate} = 6\%$$

32. (i) The three pairs of equal parts are as follows:

$AB = AC$  (Given)

$\angle BAD = \angle CAD$  (AD bisects  $\angle BAC$ ) and  $AD = AD$  (common)

(ii) Yes,  $\triangle ADB \cong \triangle ADC$  (By SAS congruence rule)

(iii)  $\angle B = \angle C$  (Corresponding parts of congruent triangles)

## Section D

33. Calculation is as follows:

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

As the number of observations are odd (5)

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

Mode = Most occurring value

For India,

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

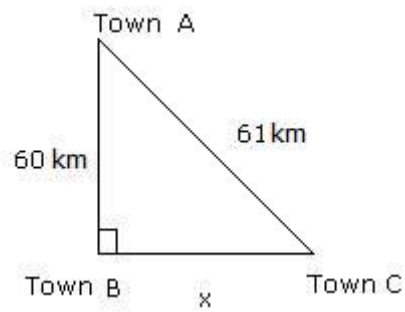
Arranging data in ascending order: 19, 19, 25, 30, 35

Thus, Median = 3<sup>rd</sup> 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

34. We can show the diagram as below:



Let the road that connects towns B and C be  $x$ .

Applying Pythagoras theorem, we get

$$h = 61, b = x \text{ and } p = 60$$

$$p^2 + b^2 = h^2$$

$$60^2 + x^2 = 61^2$$

$$3600 + x^2 = 3721 \text{ (subtract 3600 from both sides)}$$

$$x^2 = 121$$

$$x^2 = 11^2$$

$$\text{Thus, } x = 11$$

Length of the road that connects towns B and C is 11 km.

35. Let us take the unknown number to be  $y$ ; one-fourth of  $y$  is  $\frac{y}{4}$

This number  $\frac{y}{4}$  is more than 7 by 3.

Hence we get the equation for  $y$  as

$$\frac{y}{4} - 7 = 3$$

To solve this equation, first transpose 7 to RHS We get,

$$\frac{y}{4} = 3 + 7 = 10.$$

We then multiply both sides of the equation by 4, to get

$$\frac{y}{4} \times 4 = 10 \times 4 \text{ or } y = 40 \text{ (the required number)}$$

Let us check the equation formed. Putting the value of  $y$  in the equation,

$$\text{LHS} = \frac{40}{4} - 7 = 10 - 7 = 3 = \text{RHS, as required.}$$

36. Let C.P. be Rs. x.

If SP = Rs. 1920, then

$$\text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100$$

$$\text{Thus, Profit \%} = \frac{1920 - x}{x} \times 100$$

If SP = Rs 1280, then

$$\text{Loss \%} = \frac{\text{Loss}}{\text{CP}} \times 100$$

$$\text{Thus, loss \%} = \frac{x - 1280}{x} \times 100$$

As given in the question,

$$\frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100$$

$$\Rightarrow 1920 - x = x - 1280$$

$$\Rightarrow 2x = 3200$$

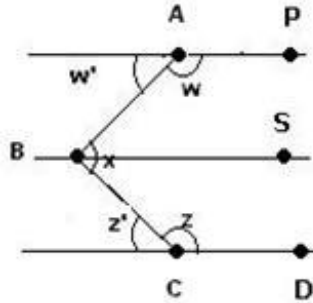
$$\Rightarrow x = 1600$$

Therefore, required SP = 125% of Rs. 1600

i.e.

$$\text{Rs.} \left( \frac{125}{100} \times 1600 \right) = \text{Rs.} 2000$$

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  $w' = 180^\circ - w = 180^\circ - 155^\circ = 25^\circ$

Angles  $z$  and  $z'$  are also supplementary which gives  $z' = 180^\circ - z = 180^\circ - 117^\circ = 63^\circ$

Therefore, we have:

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

$$\angle ABC = w' + z' = 25^\circ + 63^\circ = 88^\circ$$