CBSE Board
Class VII Mathematics
Term I
Sample Paper 3

Time: 2 ½ hours | Total Marks: 80

General Instructions:

1. **All** questions are **compulsory**.
2. **Section A** comprises of **12** questions carrying 1 mark each.
3. **Section B** comprises of **12** questions carrying 2 marks each.
4. **Section C** comprises of **8** questions carrying 3 marks each.
5. **Section D** comprises of **5** questions carrying 4 marks each.

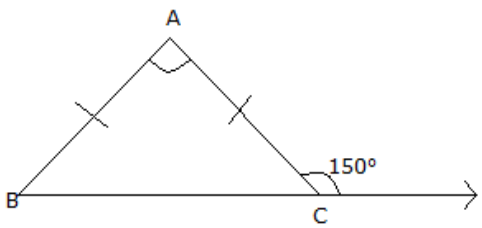
Section A
(Questions 1 to 12 carry 1 mark each)

1. $(128 \div 32) \div (-4) =$
   A. -1
   B. 2
   C. -3
   D. -4

2. If the cost one pencil is Rs 2.40, then the cost of 10 such pencils is:
   A. Rs. 24
   B. Rs. 240
   C. Rs. 10
   D. Rs. 100

3. Median of 11, 10, 12, 4, 9, 18 and 6 is _____ .
   A. 11
   B. 10
   C. 4
   D. 9

4. The first step that we will use to separate variables and constants in the linear equation $2x + 3 = 7$ is
   A. Transposing 3 to RHS
   B. Transposing 7 to LHS
   C. Diving both sides by 2
   D. Multiplying both sides with 3

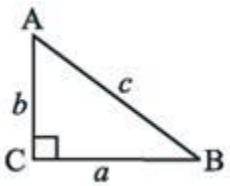


5. In the following diagram, measure of angle A is
   A. 60^o
   B. 100^o
   C. 120^o
   D. 150^o

6. The cost of petrol is increased by 12%, find the increased amount if the cost is Rs. 54 per liter.
   A. Rs 6.50
   B. Rs 6.48
   C. Rs 6.58
   D. Rs 6.00

7. Multiplicative inverse of $2\frac{2}{3}$ is
   A. $\frac{8}{3}$
   B. $\frac{-8}{3}$
   C. $\frac{3}{8}$
   D. 1

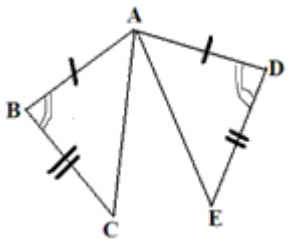
8. In the following figure, the relation between side lengths a, b and c is given by:
   A. $a^2 = b^2 + c^2$
   B. $b^2 = a^2 + c^2$
   C. $c^2 = a^2 - b^2$
   D. $c^2 = a^2 + b^2$



9. The expression 21b - 32 + 7b - 20b on simplification gives one of the following expressions:
   A. 8b + 32
   B. 8b - 32
   C. 32 - 8b
   D. 24b

10. What is the difference between the measures of a straight angle and a right angle?
   E. 45^o
   F. 60^o
   G. 100^o
   H. 90^o

11. In the figure given below, name the parts of the triangles that can be used to prove the congruence of the two triangles.



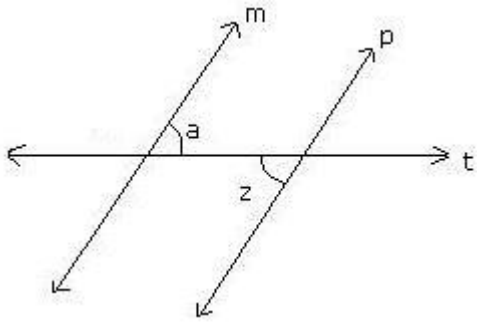
A. $AB = AD;\ BC = DE;\ \angle B = \angle D$
B. $AC = AE; AB = AD;\ BC = DE$
C. $\angle B = \angle D;\ \angle C = \angle E$
D. $\angle B = \angle D;\ \angle C = \angle E; AB = AD$

12. If on adding 9 to twice of a whole number gives 31, then the whole number is
A. 21
B. 16
C. 11
D. 7

Section B

(Questions 13 to 24 carry 2 marks each)

13. In the figure below, lines m and p are parallel; t is a transversal. If $\angle a = 57°$, then find $\angle z$.



14. Calculate median and mode for following data:
23, 45, 46, 12, 34, 87, 78, 12, 65, 33, 19, 34, 55, 67, 81, 12, 56, 98, 11,49, 50

15. Find the value of the following expression using suitable property:
725 × (-35) + (-725) x 65

16. What will you get on subtracting -134 from the sum of 38 and -87?

17. In a cricket match, the runs scored by 11 players are as follows:
    12, 23, 10, 77, 15, 78, 90, 54, 23, 10 and 1
    Find the average score.

18. In a factory, 9.2 kilograms of pumpkin pie filling is made per minute. How many kilograms of pie filling will be made in 6 minutes?

19. Sam's truck gets him $10\frac{2}{3}$ miles per gallon. Suppose the tank is empty and he puts $5\frac{1}{2}$ gallons of diesel, how far can Sam go with his truck?

20. Explain ASA congruence condition with the help of a diagram.

21. If 40% of a number is equal to two-third of another number, what is the ratio of the first number to the second number?

22. In triangles ABC and PQR, AB = 3.5 cm, BC = 7.1 cm,
    AC = 5 cm, PQ = 7.1 cm, QR = 5 cm and PR = 3.5 cm.
    Examine whether the two triangles are congruent or not.
    If yes, write the congruence relation in symbolic form.

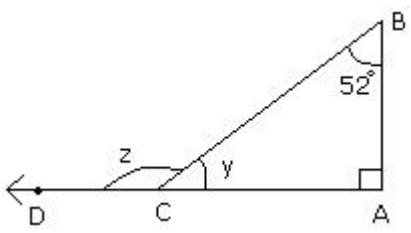
23. Solve: 12p – 5 = 25

24. By applying ASA congruence rule, it is to be established that $\Delta ABC \cong \Delta QRP$ and it is given that BC = RP. What additional information is needed to establish the congruence?

Section C

(Questions 25 to 32 carry 3 marks each)

25. From the figure given below, find $\angle y$ and $\angle z$.



26. Rahul walks $\frac{2}{5}$ km from a point A, towards north and then from there $1\frac{1}{2}$ km towards south. At what position will he be from point A?

27. A poultry farm produces 600 eggs every week and delivers them equally to 10 shops. The shopkeepers charge Rs. 5 for every good egg but they have to give Rs. 2 to the customer if the egg comes out to be rotten. A shopkeeper could only earn Rs. 276 despite selling all the eggs. How many eggs were rotten?

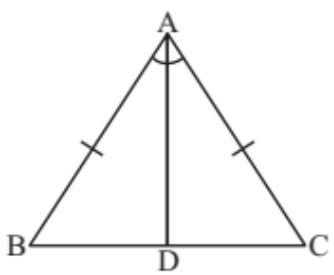
28. The ages in years of 10 teachers of a school are:
    32, 41, 28, 54, 35, 26, 23, 33, 38, 40
    (i) What is the age of the oldest teacher and that of the youngest teacher?
    (ii) What is the range of the ages of the teachers?
    (iii) What is the mean age of these teachers?

29. Raju's father's age is 5 years more than three times Raju's age. Raju's father is 44 years old. Set up an equation to find Raju's age.

30. The lengths of two sides of a triangle are 6 cm and 8 cm. Between which two numbers can length of the third side fall?

31. A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at a rate of simple interest. What is the rate of interest?

32. In Fig 7.23, AB = AC and AD is the bisector of ∠BAC.
    (i) State three pairs of equal parts in triangles ADB and ADC.
    (ii) Is $\Delta ADB \cong \Delta ADC$? Give reasons.
    (iii) Is ∠B = ∠C? Give reasons.



Section D

(Questions 33 to 37 carry 4 marks each)

33. Below are the numbers of goals scored in 1998 by the top five scorers on each of the three National Hockey League teams. Use this information to complete the chart.

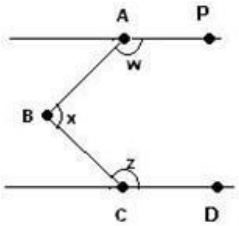
Team	Goals	Goals	Goals	Goals	Goals	Mean	Median	Mode
India	35	25	30	19	19			
Sril Lanka	45	25	14	13	14			
China	32	18	14	21	21			

34. Town A is 60 km from town B, and 61 km from town C. A road connects towns B and C directly. Find the length of this road.

35. Find a number, such that one-fourth of the number is 3 more than 7.

36. The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?

37. In the figure below, AP is parallel to CD. Angle PAB (w) is equal to 155° and angle DCB (z) is equal to 117°. Find angle ABC.



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Section A

1. Correct answer: A
   (128 ÷32)÷ (-4)
   = 4 ÷ (-4)
   = -1

2. Correct answer: A
   Total cost = 2.40 × 10
   = Rs. 24

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.
   i.e. 2x = 7 – 3

5. Correct answer: C
   ∠BCA = 180° - 150° = 30° (linear pair angles)
   Also, ∠B = ∠BCA = 30° (Angles opp. to equal sides are equal)
   ⇒ ∠A = 180° - 30° - 30° = 120° (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

21b - 32 + 7b - 20b

= 21b + 7b - 20b – 32

= 8b – 32

10. Correct answer: D

Measure of one right angle = 90^o

Measure of one straight angle = 180^o

Difference = $180^o - 90^o = 90^o$

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||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, $\angle z = 57^{o}$.

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^{th} 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 × (-35) + (-725) × 65
= 725 × (-35) - 725 × 65
= 725 x (-35 - 65) [Using distributive property]
= 725 × (-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
Pie filling made in 6 minutes = 6 × 9.2 kg = 55.2 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.

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

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

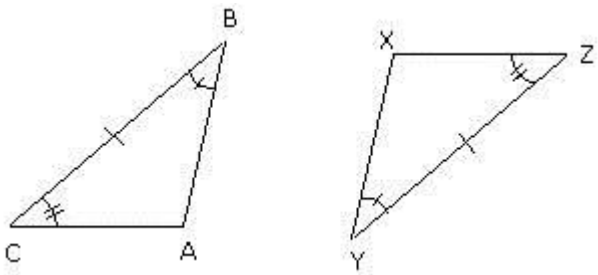
$= \frac{176}{3}$ miles

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.

$\angle ABC = \angle XYZ$ (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.

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

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

Then,

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

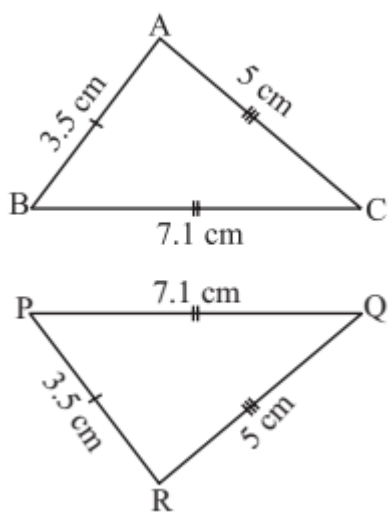
$$\Rightarrow \frac{2A}{5}=\frac{2B}{3}$$

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

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

22. Here, AB = PR (= 3.5 cm),
BC = PQ (= 7.1 cm)
And AC = QR (= 5 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 ↔ R, B ↔ P and C ↔ Q.
So, we have ΔABC ≅ ΔRPQ



23. Adding 5 on both sides of the equation,
$12p - 5 + 5 = 25 + 5$ or $12p = 30$
Dividing both sides by 12,
$\frac{12p}{12} = \frac{30}{12}$ or $p = \frac{5}{2}$
Check Putting $p = \frac{5}{2}$ in the LHS of equation,
$LHS = \frac{5}{2} \times 12 - 5 = 6 \times 5 - 5$
$= 30 - 5 = 25 = RHS$

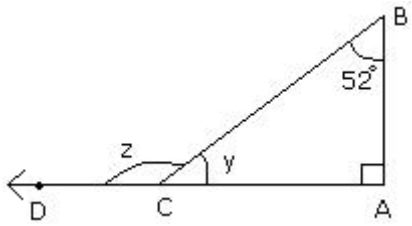
24. For ASA congruence rule, we need the two angles between which the two sides BC and RP are included. So, the additional information is as follows:

$\angle B = \angle R$ and $\angle C = \angle P$

Section C

25. In the given figure, $\angle BAC = 90°$ and $\angle ABC = 52°$
Thus, using angle sum property of triangle, we get
$\angle ABC + \angle BAC + y = 180°$
$\Rightarrow 52° + 90° + y = 180°$
$\Rightarrow 142° + y = 180°$
$y = 38°$

Now using exterior angle property, we get
$z = \angle ABC + \angle BAC = 52° + 90° = 142°$



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:

$$\frac{2}{5}+\left(-1\frac{1}{2}\right)=\frac{2}{5}+\left(\frac{-3}{2}\right)$$

$$=\frac{2\times2}{5\times2}+\left(-\frac{3\times5}{2\times5}\right)$$

$$=\frac{4}{10}+\left(-\frac{15}{10}\right)$$

$$=\frac{4-15}{10}=\frac{-11}{10}=-1\frac{1}{10}$$

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 ÷ 10 = 60
Money earned by a particular shopkeeper = Rs. 276
Money earned if all eggs were good = 60 × 5 = Rs. 300
Money loosed 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.

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

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

= 35 years

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 = Rs. 12500
Amount, A = Rs. 15500
Thus, S.I. = Rs. (A - P) = Rs. (15,500 – 12,500) = Rs. 3,000.

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

$$\text{Rate}=\left(\frac{100\times3000}{12500\times4}\right)\%$$

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

32. (i) The three pairs of equal parts are as follows:
AB = AC (Given)
∠BAD = ∠CAD (AD bisects ∠BAC) and AD = AD (common)
(ii) Yes, ΔADB ≅ ΔADC (By SAS congruence rule)
(iii) ∠B = ∠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)

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

Mode = Most occurring value

For India,

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

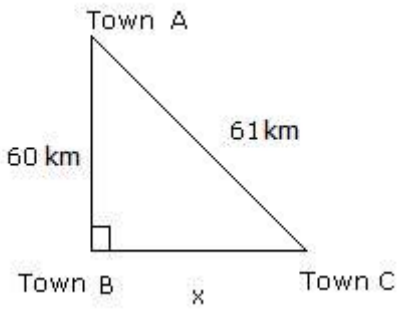
Arranging data in ascending order: 19, 19, 25, 30, 35

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

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 and p = 60

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

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

$3600 + x^2 = 3721$ (subtract 3600 from both sides)

$x^2 = 121$

$x^2 = 11^2$

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 $\frac{}{4}$

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

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

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

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

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

If SP = Rs. 1920, then

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

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

If SP = Rs 1280, then

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

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

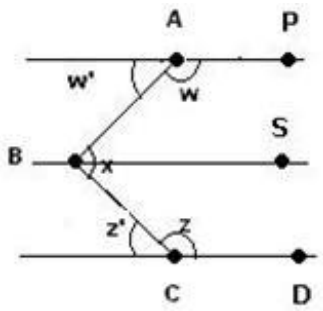
As given in the question,

$$\frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100$$
$$\Rightarrow 1920 - x = x - 1280$$
$$\Rightarrow 2x = 3200$$
$$\Rightarrow x = 1600$$

Therefore, required SP = 125% of Rs. 1600
i.e.

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

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 $w' = 180^o - w = 180^o - 155^o = 25^o$

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

Therefore, we have:

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

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