CBSE Board
Class VII Mathematics
Term I
Sample Paper 1

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. If a, b and c are integers then, according to distributive law
   A. $a \times (b + c) = a \times b + a \times c$
   B. $a \times (b + c) = a + b \times a + c$
   C. $a \times (b + c) = a \times b \times a \times c$
   D. $a \times (b + c) = a \times c - a \times b$

2. A number is chosen at random from 1 to 5. What is the probability that the number chosen is odd?
   A. $\dfrac{2}{5}$
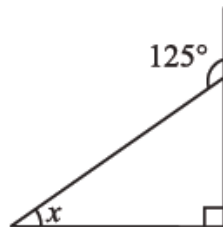   B. $\dfrac{3}{5}$
   C. $\dfrac{1}{4}$
   D. $\dfrac{1}{6}$

3. The solution of the equation 3x + 4 = 25 is
   A. 7
   B. 8
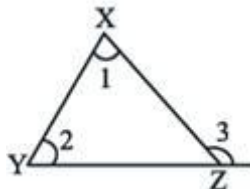   C. 9
   D. 6

4. In the figure given below, the measure of y is

    A. 30º
    B. 120º
    C. 130º
    D. 150º
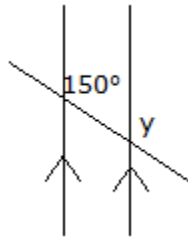
**5.** The measure of angle x, in the given figure is

    A. 45º
    B. 30º
    C. 60º
    D. 35º

6. The integer -2 - (-5) can also be written as
    A. -2 + (-5)
    B. -2 + 5
    C. 2 – 5
    D. 2 + 5

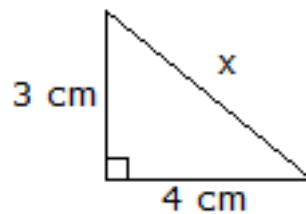**7.** In the following figure, the relation between the angles 1, 2 and 3 is

    A. $\angle 3 = \angle 1 - \angle 2$
    B. $\angle 3 + \angle 1 = \angle 2$
    C. $\angle 3 = \angle 1 + \angle 2$
    D. $\angle 3 + \angle 2 = \angle 1$

8. Mean of 11, 10, 12, 12, 9, 10, 14, 12, 9 is _____ .
   A. 20
   B. 10
   C. 11
   D. 14

9. Five added to a one third of a number gives twice the number, then the number is
   A. 3
   B. 4
   C. 5
   D. 6

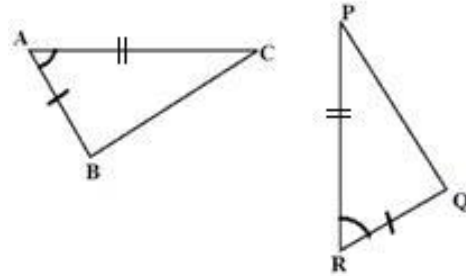10. In the following figure, the measure of angle x is
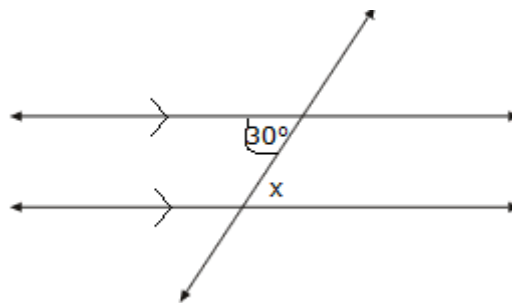
   A. 60°
   B. 150°
   C. 30°
   D. 45°

11. The value of x in the following triangle is

   A. 6 cm
   B. 8 cm
   C. 5 cm
   D. 2 cm

12. Name the pair of congruent triangles in the given figure.

   A. ΔABC ≅ ΔPQR
   B. ΔABC ≅ ΔRQP
   C. ΔBAC ≅ ΔPQR
   D. None of these

Section B
(Questions 13 to 24 carry 2 marks each)

13. What is the measure of complement of each of the following angle?
   A. 45°
   B. 54°
   C. 65°

**14.** Write the following equations in statement form:
   A. 6n + 4 = 10
   B. $\frac{y}{7}$ - 3 = 9

15. Raju has solved $\frac{2}{4}$ part of an exercise while Sameer solved $\frac{1}{2}$ part of it. Who has solved more?

16. How many angles are formed when 2 lines intersect?

17. How many $1\frac{1}{4}$ feet long strips of ribbon can be cut from a ribbon that is $7\frac{1}{2}$ feet long?

18. If RO is perpendicular to PT, find the measure of angles 1 and 2 in the figure below:
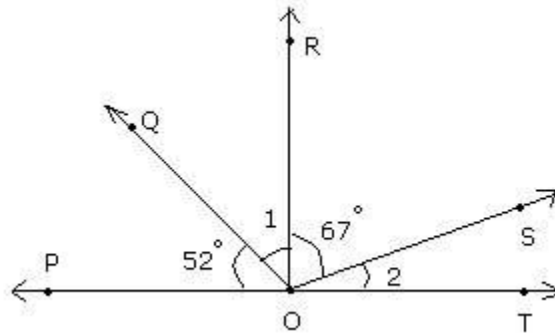

19. If $\dfrac{2x-1}{3} = \dfrac{x+2}{2}$, then what is the value of x?

20. 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?

21. It takes $\dfrac{2}{5}$ yards of material to make a shirt. How many yards of material will be required to make 6 shirts?

22. In the figure below, $\triangle CDE \cong \triangle QPR$. What is $m\angle D$?
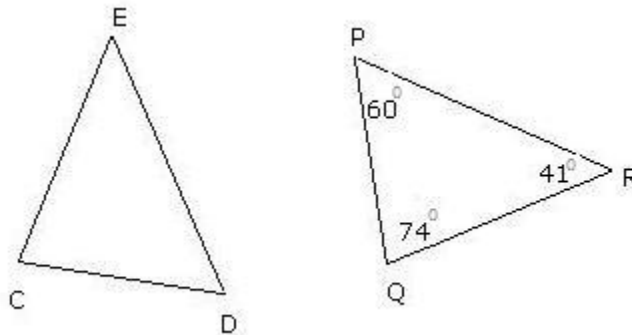

23. In a cricket match, the runs scored by 11 players are as follows
12, 23, 10, 77, 15, 78, 90, 54, 23, 10, 1
Find the average score.

**24.** Explain ASA congruence condition with the help of a diagram.

Section C
### (Questions 25 to 32 carry 3 marks each)

25. The bar graph given below shows the sales of books (in thousands) from six branches of a publishing company during two consecutive years 2000 and 2001.
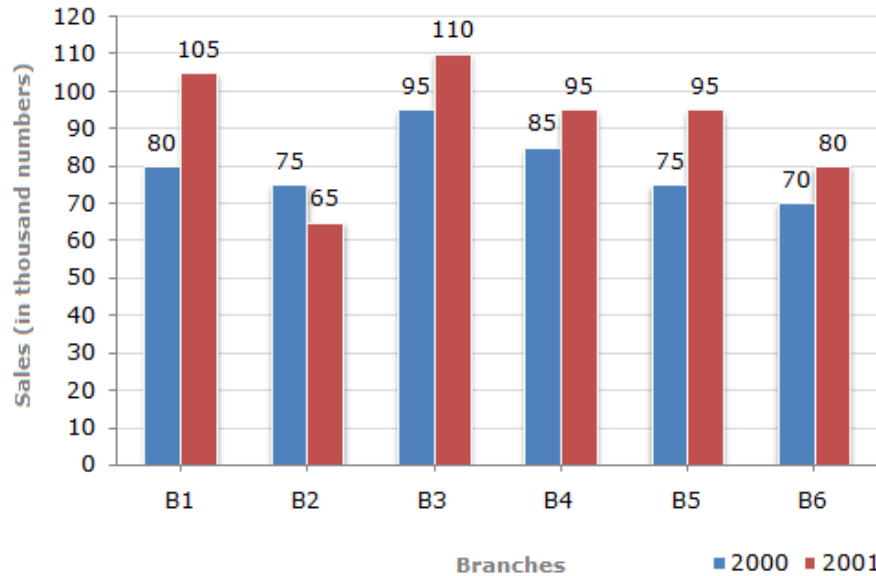
(1) What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years?

(2) What is the average sale of all the branches (in thousand numbers) for the year 2000?

(3) Total sales of branch B6 for both the years is what percent of the total sales of branches B3 for both the years?

26. Let ABC be an isosceles triangle in which AB = AC and BD is perpendicular to AC. Then, prove that $BD^2 - CD^2 = 2AD.CD$.
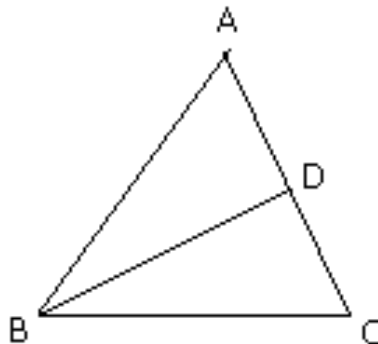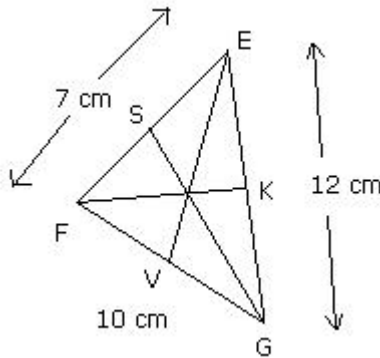
27. Name all the corresponding parts of the congruent figures given below:
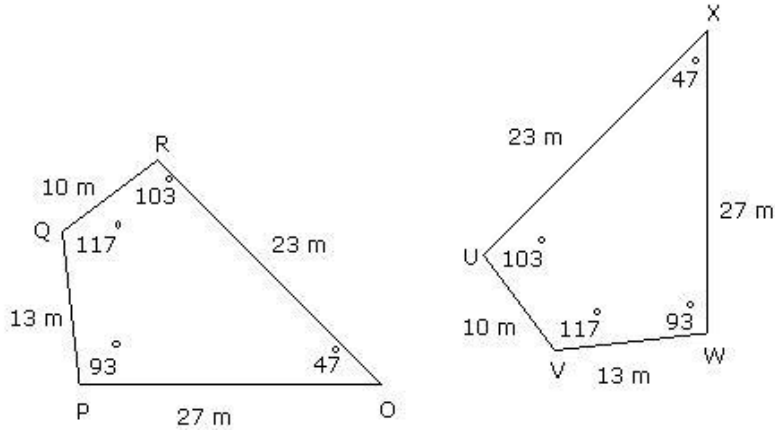
28. Sumitra has Rs 34 in denominations of 50 paisa and 25 paisa coins. If the number of 25 paisa coins is twice the number of 50 paisa coins, then how many coins of each type does she has in all?

29. In the figure below, EV, FK and GS are the medians of triangle EFG. Find the values of FS, KG and FV.

30. Two equal sides of a triangle are each 5 less than twice the third side. Perimeter of triangle is 55 m. Find the length of its sides.

31. 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?

32. The median of the given data is 29 arranged in increasing order of value. What is the value of x?

x, 20, 2x + 6, 2x + 9, 40, 45, 52

(Questions 33 to 37 carry 4 marks each)

33. A bag has 12 balls colored yellow, blue, green and red. The number of balls of each colour is the same. A ball is drawn from the bag. Calculate the probability of drawing a yellow ball, a blue ball, a green ball and a red ball at the same time. A ball is drawn from the bag. Calculate the probability of drawing a yellow ball, a blue ball, a green ball and a red ball.

34. A chemist has several beakers full of different liquids that he will use to make a solution. The chemist records the amount of liquid in each beaker: 640.6 milliliters, 908.44 milliliters, 1.5553 liters, and 0.6 liters. How many milliliters of solution will the chemist have after he mixes the liquids in the beakers?

35. In the figure, O is the midpoint of AQ and BP.
    i)   Is ΔOAB ≅ ΔOQP?
    ii) Which pairs of matching parts have you used to answer
    iii) Is AB = PQ?
    iv) Is ΔOAB ≅ ΔOPQ?
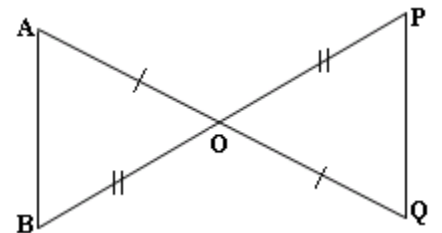
36. Given data shows performance of two unit tests.

	English	Hindi	Maths	Science	S. Science
Term I	70	60	87	60	60
Term II	78	77	60	70	60

Show the data in a double bar graph.

37. In the figure below, AP is parallel to CD. Angle PAB (w) is equal to 135° and angle DCB (z) is equal to 147°. Find angle ABC.
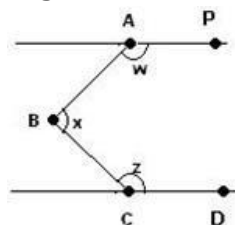
CBSE Board
Class VII Mathematics
Term I
Sample Paper 1 - Solution

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° 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 30º.

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

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, $\triangle$ABC $\cong$ $\triangle$RQP

Section B

13. To find the complement of each of the given angle, we have to subtract them from $90°$, since the sum of two complementary angles is $90°$.
(a) Complementary angle of $45° = 90° - 45° = 45°$
(b) Complementary angle of $54° = 90° - 54° = 36°$
(c) Complementary angle of $65° = 90° - 65° = 25°$

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.

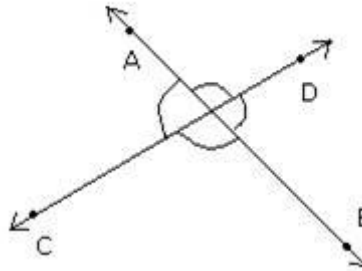When $\frac{2}{4}$ is converted into lowest form, we get

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

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 ∠POR and ∠ROT are right angles.
Thus, ∠ROS + ∠2 = 90°
∠ROS = 67°
So, ∠2 = 90° - 67° = 23°
Also, ∠POQ + ∠1 = 90°
∠POQ = 52°
So, ∠1 = 90° - 52° = 38°

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, $\triangle CDE \cong \triangle QPR$

We have to find the angle in $\triangle PQR$ 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

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

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

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

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.
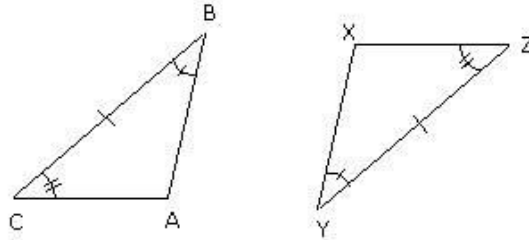
Two angles and the included side are congruent.

$\angle$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.

AD² + BD² = AB²

AD² + BD² = AC² [given, AB = AC]

AD² + BD² = (AD + CD)²

AD² + BD² = AD² + CD² + 2AD.CD

[Subtract AD² from both sides]

BD² = CD² + 2AD.CD

[Subtract CD² from both sides]

BD² - CD² = 2AD.CD

Thus, BD² - CD² = 2AD.CD

27. Given that, both the figures are congruent.
Corresponding sides:
OP ↔ WX; OR ↔ UX; QR ↔ UV; QP ↔ VW
Corresponding vertices:
O ↔ X; P ↔ W; Q ↔ V; R ↔ 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 = 4th 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,

```
        2 1 1 1
          640.60
    +   908.44
    + 1555.30
    +   600.00
      3704.34
```

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

35.

i) Is ΔOAB ≅ ΔOQP?
Solution: Yes

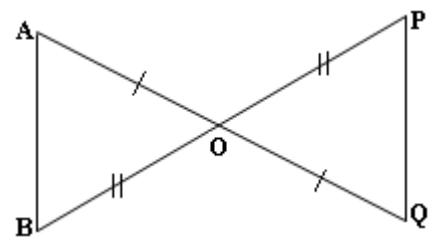ii) Which pairs of matching parts have you used to answer (i).
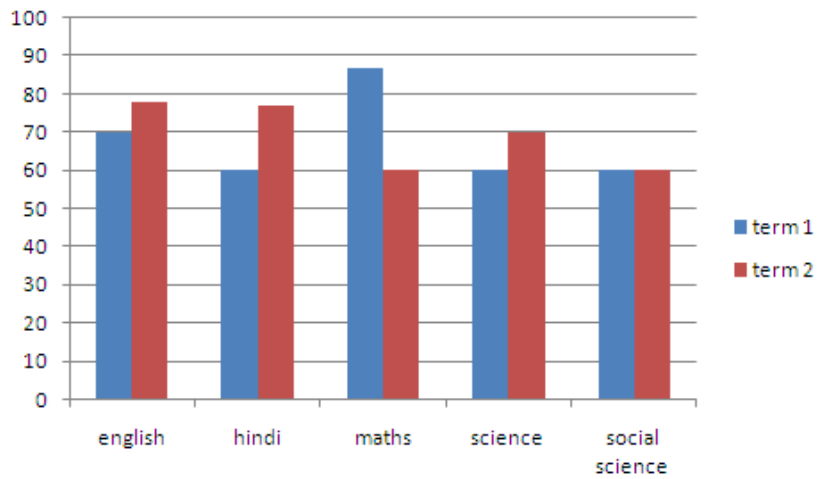Solution: OA = OQ
OB = OP
ΔAOB = ΔQOP

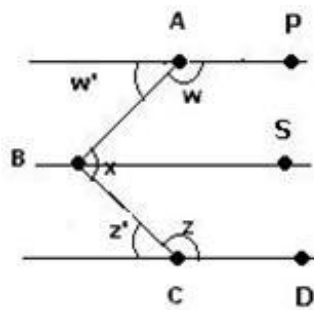iii) Is AB = PQ?
Yes

iv) Can we say ΔOAB ≅ ΔOPQ?
No

36. 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 $w' = 180^\circ - w = 180^\circ - 135^\circ = 45^\circ$

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

Therefore, we have:

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

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