

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

Time: 2 ½ hours

Total Marks: 80

Section A

1. Correct answer: C
2.5 is greater than 2.4 and less than 2.6 and 2.7.
Hence, on a number line, 2.5 will lie between 2.4 and 2.7.
2. Correct answer: B
20% of x
$$= \frac{20}{100} x$$
$$= \frac{x}{5}$$
3. Correct answer: A 5
4. Correct answer: C
 $\overline{||||} \overline{||||} ||| = 5 + 5 + 3 = 13$
5. Correct answer: A
1 is a square as well as a triangular number.
6. Correct answer: B
Cube root of $(-8) \times (-343) \times (125) = (-2) \times (-7) \times 5 = 70$
7. Correct answer: C
 $2\frac{2}{3} = \frac{8}{3}$
Thus, the multiplicative inverse of $2\frac{2}{3}$ is $\frac{3}{8}$.
8. Correct answer: C
$$\frac{4}{x-1} = \frac{3}{x+7}$$

On cross multiplying, we get $4x + 28 = 3x - 3$
 $4x - 3x = -3 - 28$
 $x = -31$
 $x + 31 = 0$

9. Correct answer: A

In a rhombus, if one angle is 70° , then its opposite angle will be 70° .
(Since, opposite angles of a rhombus are equal)

10. Correct answer: A

$$\text{Central angle} = \frac{\text{Value of component}}{\text{Total value}} \times 360^\circ = \frac{1}{4} \times 360^\circ = 90^\circ$$

11. Correct answer: C

$$\text{Square root} = 2 \times 3 \times 3 \times 5 = 90$$

12. Correct answer: D

$$\text{Actual C.P.} = \text{C.P.} + \text{Overhead expenses} = \text{Rs. } (900 + 200) = \text{Rs. } 1100$$

$$\text{Profit} = \text{S.P.} - \text{C.P.} = \text{Rs. } 1200 - \text{Rs. } 1100 = \text{Rs. } 100$$

$$\text{Profit percent} = \frac{100}{1100} \times 100 = 9\frac{1}{11}\%$$

Section B

$$13. \quad \frac{2}{5} \times \frac{-3}{7} - \frac{1}{14} - \frac{3}{7} \times \frac{3}{5} = \frac{2}{5} \times \frac{-3}{7} - \frac{3}{7} \times \frac{3}{5} - \frac{1}{14}$$

(by commutativity)

$$= \frac{2}{5} \times \frac{-3}{7} + \left(\frac{-3}{7}\right) \times \frac{3}{5} - \frac{1}{14}$$

$$= \frac{-3}{7} \left(\frac{2}{5} + \frac{3}{5}\right) - \frac{1}{14}$$

(by distributivity)

$$= \frac{-3}{7} \times 1 - \frac{1}{14} = \frac{-6-1}{14} = \frac{-7}{14} = \frac{-1}{2}$$

14. Let x be the greater part.

Then, $64 - x$ is the smaller part.

$$\text{Then } 3x = 5(64 - x)$$

$$3x = 320 - 5x$$

$$3x + 5x = 320$$

$$8x = 320$$

$$x = 40$$

So, the two parts are 40 and 24.

15. Opposite sides are equal in a parallelogram

$$\text{Therefore, } 3y + 1 = 19$$

$$\text{Or, } 3y = 19 - 1$$

$$\text{Or, } 3y = 18$$

$$\text{Or, } y = 6$$

$$\text{Also, } 4x + 3 = 23$$

$$\text{Or, } 4x = 23 - 3$$

$$\text{Or, } 4x = 20$$

$$\text{Or, } x = 5$$

$$\text{Hence } x = 5 \text{ and } y = 6.$$

16. Let the number of chairs in each row be x .

Then, the number of rows = x .

$$\text{Total number of chairs in the auditorium} = (x \times x) = x^2$$

But the number of chairs that the auditorium can accommodate = 1764 (given)

2	1764
2	882
3	441
3	147
7	49
7	7
	1

$$\therefore x^2 = 1764$$

$$= 2 \times 2 \times 3 \times 3 \times 7 \times 7$$

$$\Rightarrow x = (2 \times 3 \times 7)$$

$$= 42$$

Hence, the number of chairs in each row is 42.

17. Here,

$$\text{Total number of outcomes} = 10 + 25 = 35$$

Let E be the event of getting a prize.

$$\text{Number of outcomes favourable to event } E = 10$$

$$P(E) = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}} = \frac{10}{35} = \frac{2}{7}$$

$$\text{Probability of getting a prize} = \frac{2}{7}$$

18. Since ABCD is an isosceles trapezoidal, we have $AD = BC$

Therefore, $AD = BC = 4$ cm.

Now the perimeter of given trapezium

$$= AB + BC + CD + DA$$

$$= 12 + 4 + 8 + 4$$

$$= 28$$

Hence, the perimeter of the given trapezium is 28 cm.

19. Total number of votes = $(1136 + 7636 + 11628) = 20400$.

$$\text{Therefore, required percentage} = \left(\frac{11628}{20400} \times 100 \right) \% = 57\%$$

20. Since, the measure of each angle of rectangle is 90° .

$$\text{Therefore, } \angle ADC = y = 90^\circ$$

$$\text{Also, } \angle BAD = 90^\circ$$

$$\text{This gives, } x + 45^\circ = 90^\circ$$

$$x = 90^\circ - 45^\circ = 45^\circ$$

$$\text{Hence, } x = 45^\circ \text{ and } y = 90^\circ.$$

21. It can be observed that the squares of the given numbers can be found by first writing the counting number up to the number of 1's and then writing the reverse counting till 1.

$$\text{Thus, } 1111^2 = 1234321$$

$$11111^2 = 123454321$$

22. By cross multiplication, we get,

$$3(3x-1) = 4(2x+5)$$

$$9x-3 = 8x+20$$

$$9x-8x-3 = 20 \text{ (transposing } 8x \text{ to LHS)}$$

$$9x-8x = 20+3 \text{ (transposing } -3 \text{ to RHS)}$$

$$x = 23$$

- 23.

$$\frac{-2}{3} + \left[\frac{5}{6} + \left(\frac{-4}{7} \right) \right]$$

$$= \frac{-2}{3} + \left(\frac{35-24}{42} \right)$$

$$= \frac{-2}{3} + \frac{11}{42}$$

$$= \frac{-28+11}{42}$$

$$= \frac{-17}{42}$$

24.

Let one number be x and the other number be $(80 - x)$.

From the given information, we have:

$$\begin{aligned}\frac{x}{80 - x} &= \frac{3}{5} \\ 5x &= 240 - 3x \\ 5x + 3x &= 240 \\ 8x &= 240 \\ x &= \frac{240}{8} = 30\end{aligned}$$

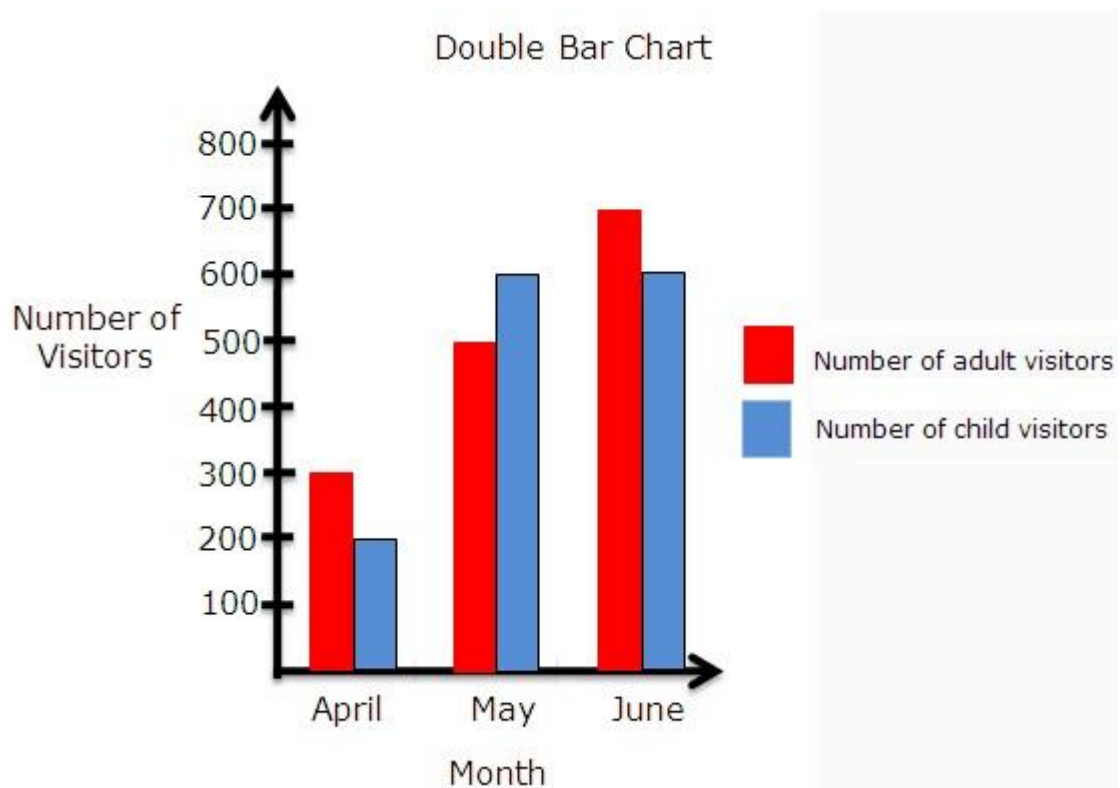
Thus, the two numbers are 30 and $(80 - 30) = 50$.

Hence, the greatest number amongst the two is 50.

Section C

25. Represent the months on the x-axis and the number of visitors on the y-axis.

The double bar graph is as follows:



26. The prime factorisation of 3087 is

$$3087 = 3 \times 3 \times \underline{7 \times 7 \times 7}$$

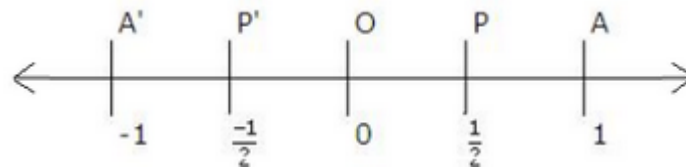
Prime factor 3 does not appear in a group of 3.

Clearly, to make 3087 a perfect cube, it must be multiplied by 3. Then, we have:

$$3087 \times 3 = \underline{3 \times 3 \times 3} \times \underline{7 \times 7 \times 7} = (3 \times 7)^3 = 21^3$$

27. Draw a number line. Take a point O on it to represent 0. Set off unit length OA to the right of O and OA' to the left of O.

Then, A represents the integer 1 and A' represents the integer -1.



Now, divide OA into two equal parts.

The point P represents the rational number $\frac{1}{2}$.

Again, divide OA' into two equal parts.

The point P' represents the rational number $-\frac{1}{2}$.

28. Let the digit at the ten's place be x

The digit at the unit's place = (x + 3)

The number is $10x + (x + 3)$

The number formed by interchanging the digits = $10(x + 3) + x$

As per the given information,

$$\frac{10(x+3)+x}{10x+(x+3)} = \frac{7}{4}$$

Cross multiplying, we get

$$4(10x + 30 + x) = 7(10x + x + 3)$$

$$40x + 120 + 4x = 70x + 7x + 21$$

$$44x + 120 = 77x + 21$$

$$120 - 21 = 77x - 44x$$

$$99 = 33x$$

$$x = 3$$

So, the digit at the ten's place = 3

And the digit at the unit's place = $(x + 3) = 3 + 3 = 6$

Thus, the number is 36.

29.

i) Let the amount of Royalty to be paid for these books is Rs. r .

Then, $20 : 15 = 30600 : r$

$$\Rightarrow r = \text{Rs} \left(\frac{30600 \times 15}{20} \right) = \text{Rs. } 22,950$$

ii) Central angle corresponding to Royalty = 15% of 360°

$$= \frac{15}{100} \times 360^\circ$$

$$= 54^\circ$$

30. In a rectangle both the diagonals are equal, so we have $PR = QS = 5.5$ cm and each angle is 90° . So $\angle Q = \angle R = 90^\circ$.

Steps of construction:

a) Draw $QR = 3.5$ cm.

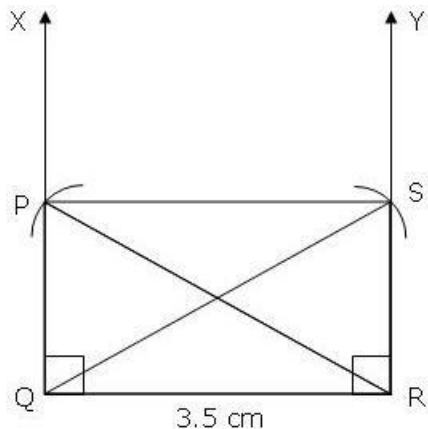
b) Draw $\angle XQR = 90^\circ$ and $\angle YRQ = 90^\circ$.

c) With R as centre and radius 5.5 cm draw an arc to cut QX at P.

d) With Q as centre and radius 5.5 cm, draw an arc to cut RY at S.

e) Join PS.

PQRS is the required rectangle.



31. Population 2 years ago = 62500

Rate of decrease = 4% per annum

Therefore, present population

$$= 62500 \times \left(1 - \frac{4}{100} \right)^2$$

$$= 62500 \times \frac{24}{25} \times \frac{24}{25}$$

$$= 57600$$

Hence, the present population of the town is 57600.

32. Convert the given rational numbers to equivalent rational numbers having same denominators.

$$\frac{-1}{3} = \frac{-1 \times 4}{3 \times 4} = \frac{-4}{12}$$

$$\frac{1}{2} = \frac{1 \times 6}{2 \times 6} = \frac{6}{12}$$

The integers between -4 and 6 are -3, -2, -1, 0, 1, 2, 3, 4, 5.

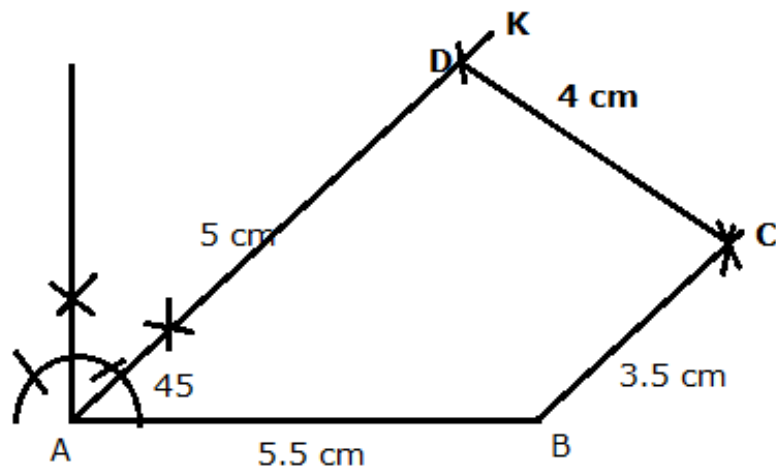
Thus, any five rational numbers lying between the given rational numbers are

$$\frac{-3}{12}, \frac{-2}{12}, \frac{-1}{12}, \frac{0}{12}, \frac{1}{12}$$

Section D

33. Steps of Construction:

- 1) Draw AB = 5.5 cm.
 - 2) At A, construct $\angle BAK = 45^\circ$.
 - 3) Cut off AD = 5 cm from AK.
 - 4) With B and D as centres and radii 3.5 cm and 4 cm respectively, draw two arcs cutting each other at C.
 - 5) Join BC and DC.
- ABCD is the required quadrilateral.



34. To show this information in a pie chart, follow the steps given below.

Work out the total number of pupils: $7 + 11 + 6 + 4 + 2 = 30$

To work out the angle of each segment, work out the fraction of the total for each grade.

$$\text{Fraction for grade A} = \frac{7}{30}$$

There are 360° in a full turn, so to work out the angle, multiply the fraction by 360° :

$$\frac{7}{30} \times 360 = 84^\circ$$

Angle made by the sector representing grade A is 84°

Repeat this process to find the angle of the sectors for the other grades

Grade	Frequency	Angle
A	7	$\frac{7}{30} \times 360^\circ = 84^\circ$
B	11	$\frac{11}{30} \times 360^\circ = 132^\circ$
C	6	$\frac{6}{30} \times 360^\circ = 72^\circ$
D	4	$\frac{4}{30} \times 360^\circ = 48^\circ$
E	2	$\frac{2}{30} \times 360^\circ = 24^\circ$

The steps to draw the pie chart are as follows:

1) Draw a line segment xy. Make an angle of 84° with xy. This sector will correspond to grade A.

2) Continue making the sectors B, C, D and E to obtain the required pie chart.



- 35.** Let the measures of two adjacent angles, $\angle A$ and $\angle B$, of parallelogram ABCD are in the ratio of 3 : 2.

Let $\angle A = 3x$ and $\angle B = 2x$

We know that the sum of the measures of adjacent angles is 180° for a parallelogram.

$$\angle A + \angle B = 180^\circ$$

$$3x + 2x = 180^\circ$$

$$5x = 180^\circ$$

$$x = \frac{180^\circ}{5} = 36^\circ$$

$$\angle A = \angle C = 3x = 108^\circ \text{ (Opposite angles)}$$

$$\angle B = \angle D = 2x = 72^\circ \text{ (Opposite angles)}$$

Thus, the measures of the angles of the parallelogram are 108° , 72° , 108° and 72° .

- 36.** Let the time required be n years.

Then,

$$\text{amount} = \text{Rs} \left\{ 1000 \times \left(1 + \frac{10}{100} \right)^n \right\}$$

$$= \text{Rs} \left\{ 1000 \times \left(\frac{11}{10} \right)^n \right\}$$

but,

$$\text{Rs} \left\{ 1000 \times \left(\frac{11}{10} \right)^n \right\} = \text{Rs } 1331$$

$$\Rightarrow \left(\frac{11}{10} \right)^n = \frac{1331}{1000} = \frac{11 \times 11 \times 11}{10 \times 10 \times 10}$$

$$\Rightarrow \left(\frac{11}{10} \right)^n = \left(\frac{11}{10} \right)^3$$

$$\Rightarrow n = 3$$

Hence, the required time = 3 years.

- 37.** It is given that 36562 plants are to be planted.

Number of rows = Number of plants in each row

The number of plants which will be left out in this arrangement has to be calculated.

That is, the number which should be subtracted from 36562 to make it a perfect square has to be calculated.

The square root of 36562 can be calculated by long division method as follows.

Number of plants left = 81