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

Time: 2 ½ hours   Total Marks: 80

Section A

1. Correct answer: B

    $2x = 7 - \dfrac{3}{2}x$

    After transposing $-\dfrac{3}{2}x$ towards left hand side, we get

    $2x + \dfrac{3}{2}x = 7$

    $\dfrac{2(2x) + (1 \times 3x)}{2} = 7$

    $\dfrac{4x + 3x}{2} = 7$

    $\dfrac{7}{2}x = 7$

2. Correct answer: A
    Indefinitely on both sides of 0

3. Correct answer: A
    An octagon is made up of 8 sides.

4. Correct answer: B
    Original Price = Rs. 50
    Increased Price = 55 - 50 = 5

    Thus, Percentage increase $= \left(\dfrac{\text{Increased price}}{\text{Original price}} \times 100\right)\%$

    Percentage increase $= \dfrac{5}{50} \times 100 = 10\%$

5. Correct answer: C
    We know that the sum of first n odd natural numbers is n^2.
    Therefore,
    $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 = 9^2$

6. Correct answer: A
    $(4)^2 \sqrt[3]{1000} = 4 \times 4 \times 10 = 2 \times 2 \times 2 \times 2 \times 2 \times 5 = (2 \times 2 \times 2) \times 2 \times 2 \times 5$
    So, the given number must be divided by $2 \times 2 \times 5 = 20$ to make it a perfect cube.

7. Correct answer: B
    Trapezium is not a parallelogram as it has only one pair of parallel sides.

8. Correct answer: A
    Number of Red Rome apple = 4 × 10 = 40

9. Correct answer: A
    It is known that the adjacent angles of a parallelogram are supplementary.
    Therefore, measure of required angle = 180º - 50º = 130º

10. Correct answer: B
    The probability of an event always lies between 0 and 1.

11. Correct answer: B
    Using the given pattern,
    $2000^2 = 4000000$

12. Correct answer: C
    The discount 50% + 50% is equal to a single discount of 75%.
    The S.P. is 25% of C.P.
    So, S.P. = $\dfrac{25}{100} \times 1200 = 300$

Section B

13.

(i) Let x be the multiplicative inverse of $\dfrac{-5}{8} \times \dfrac{-3}{7}$

$$\therefore \ \frac{-5}{8} \times \frac{-3}{7} \times x = 1$$

$$\Rightarrow \frac{15}{56} \times x = 1 \Rightarrow x = \frac{56}{15}$$

(ii) Let x be the multiplicative inverse of $-1 \times \dfrac{-2}{5}$

$$\text{So, } -1 \times \frac{-2}{5} \times x = 1 \Rightarrow \frac{2}{5}x = 1$$

Or, x = $\dfrac{5}{2}$

14. Let x be the ten's digit of the two-digit number.
Then its unit's digit = x + 7.
Number = unit's digit + 10(ten's digit) = (x + 7) + 10(x) = 11x + 7.
Sum of the digits = (x + 7) + (x) = 2x + 7.
Given, sum of the digits is half of the whole number. Therefore,

$$(2x+7)=\frac{1}{2}(11x+7)$$

4x + 14 = 11x + 7
4x - 11x = 7 - 14
-7x = -7
x = 1
Ten's digit of the two-digit number is x = 1.
Unit's digit of the two-digit number = x + 7 = 1 + 7 = 8
Thus, the required number is 18.

15. y = $\angle$EHP (Alternate interior angles as OP||HE)
y = 40°
70° = $\angle$EHO = z + 40° (Corresponding angles as OP||HE)
70° − 40° = z
z = 30°
$\angle$HEP = $\angle$EHO (Adjacent pair of angles as HO||EP)
x + (z + 40°) = 180°
x + 70° = 180°
x = 110°

16. Total number of students = 35
i) Number of boys = 20

$\therefore$ Required probability $= \dfrac{20}{35} = \dfrac{4}{7}$

ii) Number of girls = 15

$\therefore$ Required probability $= \dfrac{15}{35} = \dfrac{3}{7}$

17. $82^2 = (80 + 2)^2$
In the property $(a + b)^2 = a^2 + b^2 + 2ab$
Substituting a = 80 and b = 2, we get
$(80 + 2)^2 = 80^2 + 2^2 + 2 \times 80 \times 2$
            = 6400 + 4 + 320
            = 6724

18. From the graph, it is clear that:
5 students favoured orange and 1 student favoured green colour.
Now, 5 - 1 = 4
Therefore, 4 more students favoured orange colour than green.

19. Cost of TV set = Rs. 36500.
Sales tax = 8% of Rs. 36500

$$= Rs\left(36500 \times \frac{8}{100}\right)$$

= Rs2920

Therefore, Bill amount = Rs. (36500 + 2920) = Rs. 39420

20. First four triangular numbers are: 1, 3, 6 and 10.
Now, $1 + 3 = 4 = 2^2$
$3 + 6 = 9 = 3^2$
$6 + 10 = 16 = 4^2$
Here, 4, 9 and 16 all are square numbers.

21. $3(2x - 1) = 2(x + 4) + 1$
$6x - 3 = 2x + 8 + 1$
$6x - 3 - 2x = 8 + 1$ (Transposing 2x to LHS)
$6x - 2x = 8 + 1 + 3$ (Transposing -3 to RHS)
$4x = 12$
Dividing both sides by 4,

$x = \dfrac{12}{4} = 3$

$x = 3$

22.
We know that $16 < 18.5 < 25$

Also, $4^2 = 16$ and $5^2 = 25$

$\therefore \sqrt{16} < \sqrt{18.5} < \sqrt{25}$
$\Rightarrow 4 < \sqrt{18.5} < 5$

Thus, the square root of 18.5 lies between 4 and 5.

23. Original number = 4000

Increased % = 35%

Thus, Number of students now = Original number + 35% of 4000

$$\text{Number of students} = 4000 + \frac{35}{100} \times 4000$$

$$= 4000 + 1400$$

$$= 5400$$

24. Here, n(S) = 10 + 25 = 35
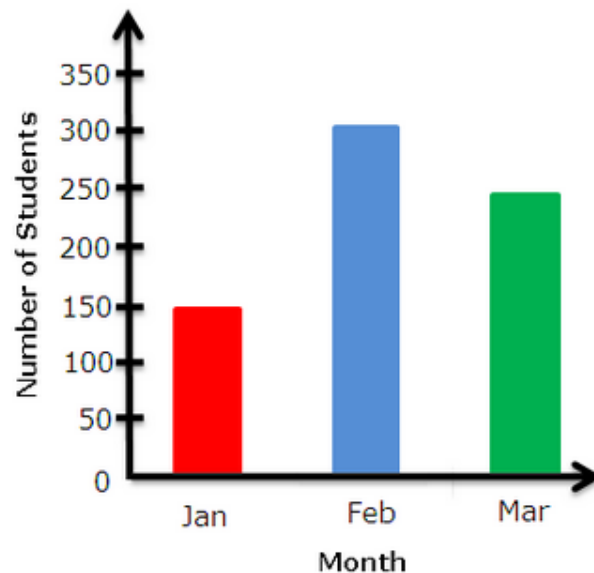
Let E be the event of getting a prize.

n(E) = 10

$$\Rightarrow P(E) = \frac{n(E)}{n(S)} = \frac{10}{35} = \frac{2}{7}$$

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

Section C

25.

a) If we choose a scale of 1:50 for the frequency then the vertical bar chart will be as shown.

b) Percentage increase in the visitors in March as compared to January is

$$\frac{250 - 150}{150} \times 100 = 66.67\%$$

c) Percentage of visitors who came in February as compared to the total number of visitors is

$$\frac{300}{150 + 300 + 250} \times 100 = 42.86\%$$

26. $CP = \left(\dfrac{100}{100 + gain\%}\right) \times SP$

Thus, CP of 1st transistor

$= \left(\dfrac{100}{120} \times Rs\ 840\right) = Rs\ 700$

CP of 2nd transistor

$= \left(\dfrac{100}{96} \times Rs\ 960\right) = Rs\ 1000$

So, total C.P. = Rs. (700 + 1000) = Rs. 1700.
Total S.P. = Rs. (840 + 960) = Rs. 1800.
Gain = Rs (1800 - 1700) = Rs 100

$\therefore$ Gain% $= \left(\dfrac{100}{1700} \times 100\right)\% = 5\dfrac{15}{17}\%$

27. $\dfrac{x + 0.25}{3} - x = 0.5$

$\dfrac{x + 0.25}{3} - \dfrac{x}{1} = 0.5$

LCM of 3 and 1 = 3

$\dfrac{x + 0.25 - 3x}{3} = 0.5$

Multiplying both sides with 3, we get
0.25 - 2x = 0.5 × 3
0.25 - 2x = 1.5
Transposing 0.25 to right hand side
-2x = 1.5 - 0.25
-2x = 1.25
x = -0.625

28. Rate of interest = 8% per annum = 4% per half year.
Time = 1 year = 2 half years.
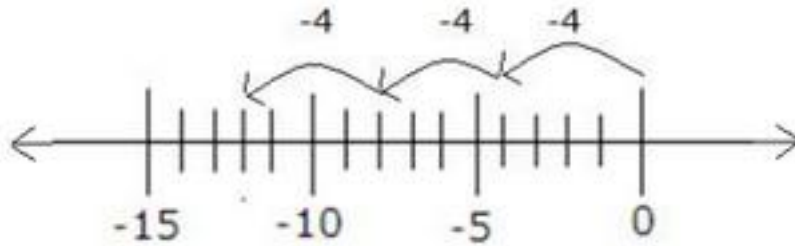Principal = Rs 5000
Using compound interest formula, we have:

$Amount = P\left(1 + \dfrac{r/2}{100}\right)^{2n}$

$= 5000\left(1 + \dfrac{4}{100}\right)^2$

$= 5000 \times \dfrac{26}{25} \times \dfrac{26}{25}$

$= Rs\ 5408$

Therefore, compound interest = Rs (5408 - 5000) = Rs 408

29.

On the number line -4×3 means three jumps of 4 to left of 0.
By making three jumps of 4 we move 12 spaces to left of 0 and reach at the point -12.
Thus, -4×3 = -12.

30.

Let the numerator be x.

Then, denominator will be (1 + 2x).

According to the given information,

$$\frac{x + 4}{1 + 2x + 4} = \frac{3}{5}$$

$$\frac{x + 4}{2x + 5} = \frac{3}{5}$$

$$5x + 20 = 6x + 15$$

$$20 - 15 = 6x - 5x$$

$$x = 5$$

∴ Numerator = 5 and denominator = 1 + 2x = 1 + 10 = 11

Thus, the fraction is $\frac{5}{11}$

31. We know that the sum of the interior angles of a polygon of n sides is equal to (2n - 4) right angles.
Therefore, sum of all interior angles of a pentagon is 540º.
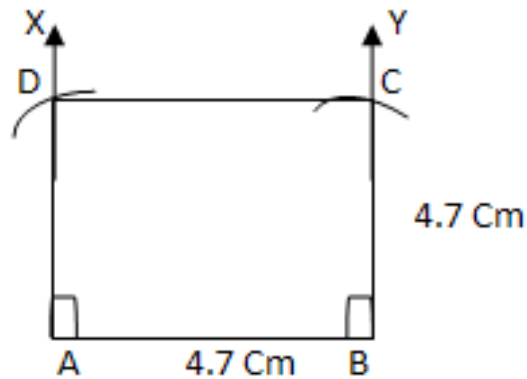x + 100º + x + 90º + 90º = 540º
2x = 540º - 280º
$x = \dfrac{260º}{2} = 130º$

32. Steps of construction:
   a) Draw AB = 4.7cm.
   b) Draw ∠XAB = 90° and ∠YBA = 90°.
   c) With A as centre and radius 4.7cm, draw an arc which cuts AX at D.
   d) With B as centre and radius 4.7cm, draw an arc which cuts BY at C.
   e) Join DC.

   ABCD is the required square

Section D

33. Let the son's age be x years.
   ∴ Mr. Ranjan's age is 7x years.
   After 10 years, his son's age will be = (x + 10) years
   After 10 years, Mr. Ranjan's age will be = (7x + 10) years
   By the given condition,
   (7x + 10) = 3(x + 10)
 $\Rightarrow$ 7x + 10 = 3x + 30
   $\Rightarrow$ 7x - 3x = 30 – 10
   $\Rightarrow$ 4x = 20 or x = 5
   ∴ Son's age is 5 years.
   Mr. Ranjan's age is 7×5 = 35 years

34. Steps of Construction:

    (i)   Draw AB = 6 cm.

    (ii)   With A as centre and radius 6.8 cm, draw an arc.

    (iii) With B as centre and radius 4.5 cm draw another arc, cutting the previous arc at C.

    (iv) Join BC and AC.

    (v)   With A as centre and radius 4.5 cm, draw an arc.

    (vi) With C as centre and radius 6 cm draw another arc, cutting the previously drawn arc at D.

    (vii) Join DA and DC.

        ABCD is the required parallelogram.
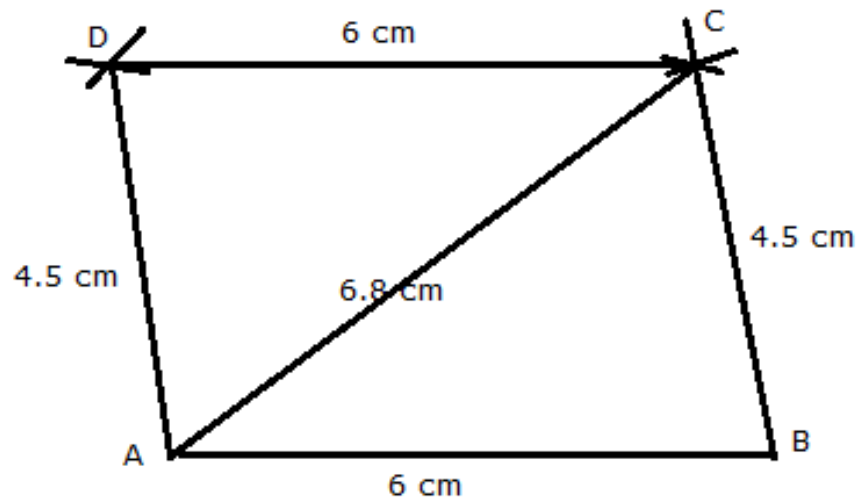
35. Total money = Rs. 10800

To work out the angle of each segment, work out the fraction of the total that each item got.

Start with food: $\dfrac{3150}{10800}$

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

$\dfrac{3150}{10800} \times 360° = 105°$

The food sector has an angle of 105°

Repeat this process to find the angle of the segments for the other items.

Once you have calculated the angles of the segments, construct the pie chart

Item	Amount	Central Angle
Food	3150	$\dfrac{3150}{10800} \times 360° = 105°$
Rent	2100	$\dfrac{2100}{10800} \times 360° = 70°$
Education	1950	$\dfrac{1950}{10800} \times 360° = 65°$
Savings	2400	$\dfrac{2400}{10800} \times 360° = 80°$
Misc	1200	$\dfrac{1200}{10800} \times 360° = 40°$

36. Let the measures of two adjacent angles, ∠A and ∠B, of parallelogram ABCD are in the ratio of 3 :2.

Let ∠A = 3x and ∠B = 2x

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

∠A + ∠B = 180°

3x + 2x = 180°

5x = 180°

$x = \dfrac{180}{5} = 36°$

∠A = ∠C = 3x = 108° (Opposite angles)

∠B = ∠D = 2x = 72° (Opposite angles)

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

37. We find the prime factors of 2048.

2	2048
2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

∴2048 = 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2

We find in the above prime factorisation, the number 2 does not make a pair, so 2048 is not perfect square.

If 2 gets a pair, then the number will becomes a perfect square. Thus, by multiplying the number by 2, we get a perfect square.

2048 × 2 = 4096 is a perfect square.

Hence, the required number which is to be multiplied with 2048 to get a perfect square is 2.