

**CBSE Board**  
**Class VI Mathematics**

Time: 2 ½ hours

Total Marks: 80

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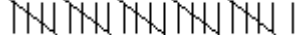
**General Instructions:**

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

1. The simplest form of fraction of 1.35 is
  - A.  $\frac{27}{20}$
  - B.  $\frac{29}{20}$
  - C.  $\frac{31}{25}$
  - D.  $\frac{23}{20}$
2. Which of the following is an example of primary data?
  - A. Data collected from a group of 40 students
  - B. Data collected from world wide web
  - C. Data collected from a school records
  - D. Data collected from DISE
3. If the marks of 5 students out of 50 in a math exam are:  
45, 32, 47, 21, 42  
The difference between maximum and minimum marks is
  - A. 28
  - B. 24
  - C. 25
  - D. 26

4. Perimeter of a square = \_\_\_\_\_  $\times$  length of a side  
A. 1  
B. 2  
C. 3  
D. 4
5. If  $p$  is the side length of square then its area is  
A.  $p^2$   
B.  $p^3$   
C.  $4p$   
D.  $2p$
6. Which of the following ratio is not equivalent to 50 : 90?  
A. 5 : 9  
B. 15 : 19  
C. 10 : 18  
D. 25 : 45
7. \_\_\_\_\_ triangle has exactly one line of symmetry.  
A. An equilateral  
B. A scalene  
C. An isosceles  
D. A right-angled
8. A \_\_\_\_\_ is used to draw and measure angles.  
A. protractor  
B. ruler  
C. set square  
D. divider
9. Which of the following decimal has the highest value?  
A. 0.5  
B. 0.6  
C. 0.7  
D. 0.2
10. Write the expression for "n divided by 5 and then 8 is subtracted from the result".  
A.  $\frac{n}{5} + 8$   
B.  $\frac{n}{5} - 8$   
C.  $5n - 8$   
D.  $\frac{5}{n} - 8$

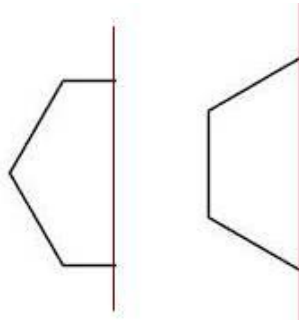
- 11.** Which of the following letters has a horizontal line of symmetry?
- A. H  
B. S  
C. P  
D. All of the above
- 12.** The tally mark  represents the number
- A. 26  
B. 28  
C. 25  
D. 29

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

13. Preeta purchased a book, a pen and a notebook for Rs. 165.35, Rs. 72 and Rs. 14.85 respectively. How much money will he have to pay to the shopkeeper for these items?
14. Classify the following data as primary or secondary.  
(a) Classifying date of birth of different students from class attendance register.  
(b) Collecting Name, roll number information from each individual.
15. Perimeter of a regular pentagon is 25 cm. Find the length of its one side.
16. Students are marching in a parade. There are 11 students in a row. What is the rule, which gives the number of students, given the number of rows?
17. List any three symmetrical objects from your home or school.
18. Draw a line segment of length 4.5 cm using ruler and compass.
19. Do the ratios 30 cm to 4 m and 20 sec to 6 minutes form a proportion?
20. By how much should 84.5 be decreased to get 27.84?
21. Find the area of the shaded portion given below:



22. Complete the following images whose one half and axis of symmetry is given.



23. Study the following chart and answer the questions that follow:

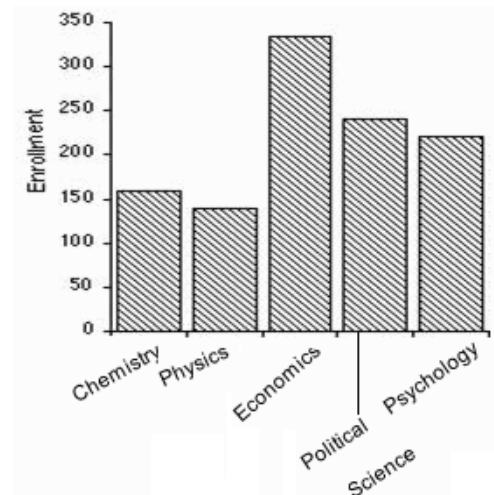
Ice-cream	Number of Students
Vanilla	
Butterscotch	
Strawberry	
Chocolate	

- (a) How many students like butterscotch ice-cream?  
 (b) Which flavor of ice-cream is liked by less number of students?
24. An isosceles triangle has equal sides of 18 cm each. Find the third side if the perimeter of triangle is 50 cm.

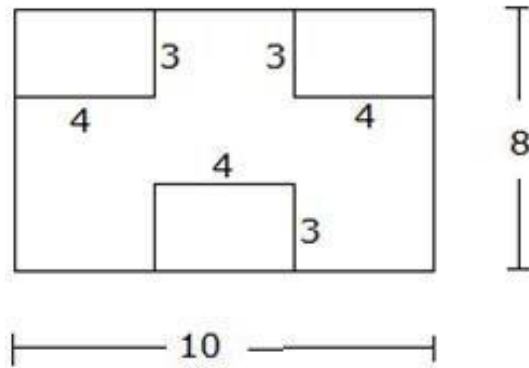
### Section C (Questions 25 to 32 carry 3 marks each)

25. If the marks of Rohit, Ajay and Vipul are in ratio of 4 : 5 : 6. If Ajay got 75 marks then find the marks of Rohit and Vipul?

26. From the following graph, find
- (a) Which course has the most students enrolled in it?
- (b) Order the courses by enrollment from lowest to highest.
- (c) The enrollment in Economics is approximately how many times larger than the enrollment in Chemistry?



27. Draw any line segment  $\overline{AB}$ . Without measuring  $\overline{AB}$ , construct a copy of  $\overline{AB}$ .
28. Three rectangles of dimensions 4 m x 3 m are removed from a large rectangle of dimensions 10 m x 8 m. Find the area of the remaining part.



29. If the interest on a sum of Rs. 5250 for a year is Rs. 420, then what is the rate percent of interest per annum?
30. A bus travels 300 km in 6 hours.  
 (a) How much time is required to cover 280 km with the same speed?  
 (b) Find the distance covered in 10 hours with the same speed.
31. Rahul wants to paint all the four square walls of his room of side 10 m. If the cost of painting is Rs. 20 per sq. m then what will be the total cost of painting?
32. Many people visit Delhi every year. The exact visitor figures for 2009 and 2010 can be found in the table below. Use it to answer the questions given below.

	2009		2010	
	Adults	children	adults	children
Jan	1050	900	2000	1000
Feb	2000	1100	2200	800
March	1200	1300	1200	1200
April	3000	780	1250	1000
May	3000	2900	3000	3000
June	1200	1200	3000	2000

- (a) For both years, find the month(s) in which maximum adults visited.
- (b) For both years, find the month(s) in which maximum children visited.
- (c) For both years, find the month(s) in which the number of children and adults were the same.

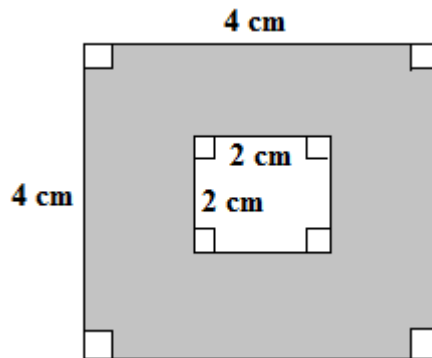
**Section D**  
**(Questions 33 to 37 carry 4 marks each)**

33. In the following table there is given the number of women who use cosmetics in a city in different years. Represent the above data by pictograph.

Year	2000	2001	2002	2003
No. of women	5000	7000	9000	12000

34. Draw a circle with centre O and any radius. Join its one diameter CD and construct its perpendicular bisector. Does it pass through centre O?

35. Calculate the area of the shaded portion:



36. The total weight of a bag containing 13 kg 750 g potatoes and 8 kg 80 g of tomatoes is 22 kg 200 g. How much is the weight of the empty bag?
37. Solve:  $3(x + 3) - 2(x - 1) = 5(x - 5)$

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**Solution**

Time: 2 ½ hours

Total Marks: 80

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**Section A**

1. Correct answer: A  
 $1.35 = \frac{135}{100} = \frac{27 \times 5}{20 \times 5} = \frac{27}{20}$
2. Correct answer: A  
Data collected from a group of 40 students is an example of primary data.
3. Correct answer: D  
Maximum marks = 47, Minimum marks = 21  
Difference = Maximum – Minimum = 47 – 21 = 26
4. Correct answer: D  
Perimeter of a square = 4 × length of a side
5. Correct answer: A  
Area of a square = side × side = p × p = p<sup>2</sup>
6. Correct answer: B  
15 : 19 is not equivalent to 50 : 90.
7. Correct answer: C  
An isosceles triangle has exactly one line of symmetry.
8. Correct answer: A  
Protractor is used to draw and measure angles.
9. Correct answer: C  
Out of the four the one-tenth part of 0.7 is the greatest. Hence, 0.7 has the highest value.
10. Correct answer: B  
 $\frac{n}{5} - 8$  is the correct expression.
11. Correct answer: A  
Letter H has a horizontal line of symmetry.

12. Correct answer: B

$$\text{|||||} = 5 + 5 + 5 + 5 + 5 + 3 = 28$$

### Section B

13. Cost of a book = Rs. 165.35

Cost of a pen = Rs. 72.00

Cost of a notebook = Rs. 14.85

Total Cost is given by,

Rs 165.35

Rs 72.00

Rs 14.85

Rs 252.20

Total money to be paid by Preeta = Rs. 252.20

14. (a) Secondary

(b) Primary

15. We know that a regular pentagon has 5 sides, so we can divide the perimeter by 5 to get the measure of one side.

$$\text{One side of pentagon} = 25 \text{ cm} \div 5 \text{ cm} = 5 \text{ cm}$$

16. Let the number of rows be 'n'.

Since there are 11 students in a row and number of rows are n, the Rule is given as,

Number of students in the parade =  $11n$ .

17. Three symmetrical objects are

(i) An electric tube-light

(ii) A water glass

(iii) A fan

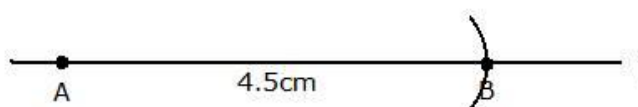
18. Steps of construction:

(1) Draw a line l. Mark a point A on a line l.

(2) Place the compass' pointer on the 0 mark of the ruler. Open it to place the pencil point up to the 4.5 cm mark.

(3) Taking caution that the opening of the compass has not changed, place the pointer on A and swing an arc to cut l at B.

(4)  $\overline{AB}$  is a line segment of required length.





19. Ratio of 30 cm to 4 m

$$= 30 : 4 \times 100 \text{ (1 m = 100 cm)}$$

$$= 30 : 400$$

$$= 3 : 40$$

Ratio of 20 sec to 6 minutes

$$= 20 : 6 \times 60 \text{ (1 min = 60 sec)}$$

$$= 20 : 360$$

$$= 1 : 18$$

Since,

$$3 : 40 \neq 1 : 18 ,$$

Therefore the given ratio do not form a proportion.

20. To get this answer subtract 27.84 from 84.5

$$84.50$$

$$-27.84$$

$$\hline 56.66$$

Hence, 56.66 must be subtracted from 84.5 to get 27.84

21. The shaded portion is made up of line segments. It is covered by full and half squares. We have to calculate the number of fully filled and half filled squares.

$$\Rightarrow \text{Fully filled squares} = 6$$

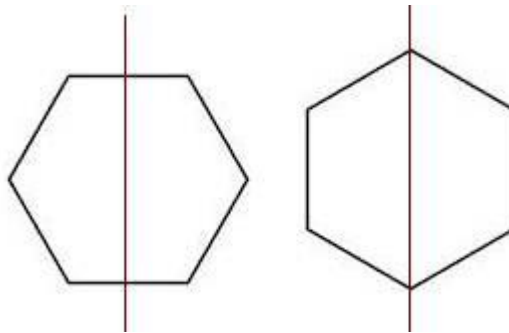
$$\Rightarrow \text{Half-filled squares} = 2$$

$$\text{Area covered by fully filled square} = 6 \times 1 = 6 \text{ sq. units.}$$

$$\text{Area covered by half-filled square} = 2 \times \frac{1}{2} = 1$$

$$\text{Therefore, total area} = 6 + 1 = 7 \text{ sq. units}$$

22. Drawing the relational part the images become as follows:



23. (a) Butterscotch is liked by  $5 + 5 + 2 = 12$  students.

(b) Chocolate flavor is less favourite.

24. Let the isosceles triangle be ABC, in which  $AB = AC = 18$  cm.

Also perimeter is given 50 cm, we need to find BC.

Perimeter of triangle = 50 cm

$$AB + AC + BC = 50 \text{ cm}$$

$$\Rightarrow 18 + 18 + x = 50 \text{ cm}$$

$$\Rightarrow 36 + x = 50 \text{ cm}$$

$$\Rightarrow x = 50 - 36 = 14 \text{ cm}$$

Therefore, length of third side is 14 cm.

### Section C

25. Let the marks of Rohit, Ajay and Vipul be  $4x$ ,  $5x$  and  $6x$  respectively.

Given that Ajay's marks = 75

$$\Rightarrow 5x = 75$$

$$\Rightarrow x = \frac{75}{5} = 15$$

Hence, marks of Rohit =  $4x = 4 \times 15 = 60$  marks

Marks of Vipul =  $6x = 6 \times 15 = 90$  marks

26.

(a) Economics has the most students enrolled.

(b) From lowest to highest: Physics, Chemistry, Psychology, Political Science, Economics.

(c) From ratio of the number of students enrolled in Economics to the number enrolled in Chemistry we can state that enrollment in Economics is 2 times larger than in Chemistry.

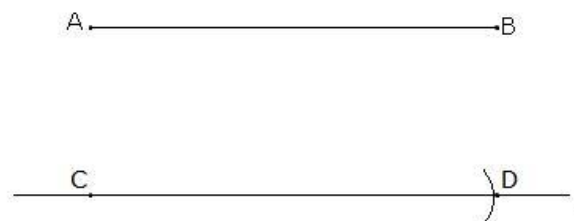
27. Steps of construction:

(1) Given  $\overline{AB}$  whose length is not known.

(2) Fix the compasses pointer on A and the pencil end on B. The opening of the instrument now gives the length of  $\overline{AB}$ .

(3) Draw any line  $l$ . Choose a point C on  $l$ . Without changing the compasses setting, place the pointer on C.

(4) Swing an arc that cuts  $l$  at a point, say D. Now  $\overline{CD}$  is a copy of  $\overline{AB}$ .



28. From the figure the smaller rectangles are equal.

Therefore,

Area of one smaller rectangle = length  $\times$  breadth =  $3 \times 4 = 12$  sq. m

Area of 3 smaller rectangles =  $3 \times 12 = 36$  sq. m

Area of bigger rectangle = length  $\times$  breadth =  $10 \times 8 = 80$  sq. m

Therefore, area of remaining part =  $80 - 36 = 44$  sq. m

29. Rate percent per annum is interest given on Rs. 100 for a year.

Let the interest for Rs. 100 per annum be Rs. x.

Principal : Principal :: Interest : Interest

5250 : 100 :: 420 : x

Product of extreme terms =  $5250x$

Product of the middle terms =  $100 \times 420 = 42000$

$5250x = 100 \times 420$

$$\Rightarrow x = \frac{42000}{5250} = 8$$

- 30.

- (a) In this case time is unknown and distance is known. Therefore, we proceed as follows:

6 hours =  $6 \times 60$  minutes = 360 minutes

300 km is covered in 360 minutes

Time required to cover 1 km distance =  $\frac{360}{300} = \frac{6}{5}$  min

Therefore, 280 km can be covered in  $\frac{6}{5} \times 280 = 336$  minutes = 5 hours 36 minutes

- (b) In this case distance is unknown and time is known. Therefore, we proceed as follows:

Distance covered in 6 hours = 300 km

Distance covered in 1 hour =  $\frac{300}{6} = 50$  km

Therefore, distance covered in 10 hours =  $50 \times 10 = 500$  km.

31. Area of a square wall = side  $\times$  side =  $10 \times 10 = 100$  sq. m

Area of four square walls =  $4 \times 100 = 400$  sq. m

Cost of painting 1 sq. m of wall = Rs. 20

Therefore, total cost of painting =  $\text{Rs. } 20 \times 400 = \text{Rs. } 8000$

32. (a) In 2009-April, May and in 2010-May, June.

(b) In 2009-May and in 2010-May.

(c) In 2009-June and in 2010-March and May

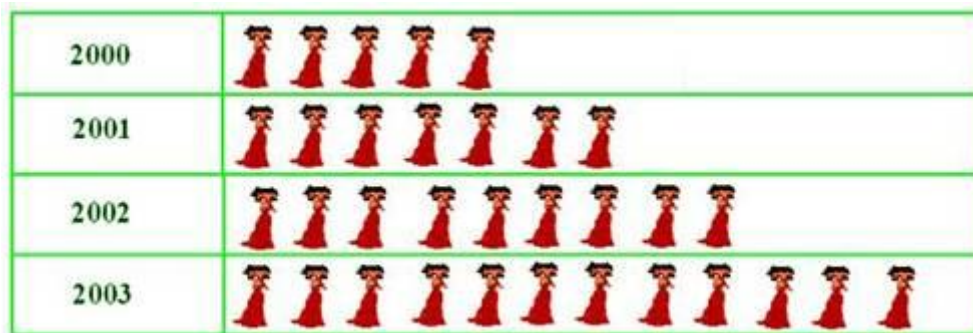
## Section D

33. Here, we scale



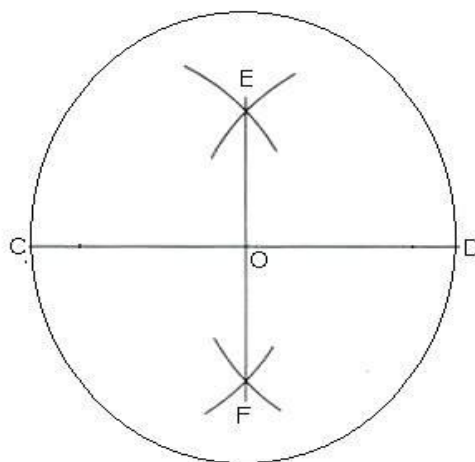
= 1000 women

The pictograph is:

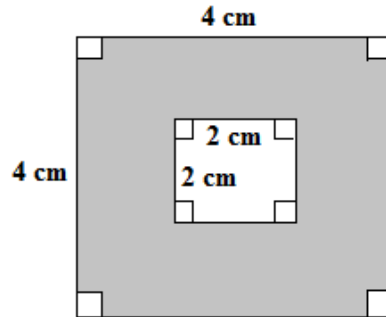


34. Steps of construction:

1. Draw a circle with centre O and any radius. Join a diameter CD.
2. Taking C as a centre and radius more than half of length CD, draw two arcs in upper and lower portion of CD.
3. Taking D as a centre and same radius, draw two arcs which cut the previous arcs at E and F.
4. It is observed that the perpendicular bisector EF passes through centre O.



35. Area(outer square) =  $4 \text{ cm} \times 4 \text{ cm} = 16 \text{ cm}^2$   
 Area(inner square) =  $2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$   
 Area(shaded portion) = Area(outer square) - Area(inner square) =  $16 - 4 = 12 \text{ cm}^2$



36. Weight of potatoes =  $13\text{kg } 750\text{g} = 13.750 \text{ kg}$   
 Weight of tomatoes =  $8\text{kg } 80\text{g} = 8.080 \text{ kg}$   
 Total weight of vegetables:  

$$\begin{array}{r} 13.750 \text{ kg} \\ + 8.080 \text{ kg} \\ \hline 21.830 \text{ kg} \end{array}$$
  
 Total weight of bag and vegetables =  $22.200 \text{ kg}$   
 Total weight of vegetables in it =  $21.830 \text{ kg}$   
 Weight of empty bag:  

$$\begin{array}{r} 22.200 \text{ kg} \\ - 21.830 \text{ kg} \\ \hline 0.370 \text{ kg} \end{array}$$
  
 Hence, weight of empty bag =  $0.370 \text{ kg} = 370 \text{ g}$

37.  $3(x + 3) - 2(x - 1) = 5(x - 5)$   
 $\Rightarrow 3x + 3 - 2x + 2 = 5x - 25$  [removing parentheses]  
 $\Rightarrow x + 11 = 5x - 25$   
 $\Rightarrow x - 5x = -25 - 11$   
 [Transposing the terms with variables on one side and constants on another]  
 $\Rightarrow -4x = -36$  [dividing by 4 on both sides]  
 $\Rightarrow x = 9$