

CBSE Board
Class VI Mathematics

Time: 2 ½ hours

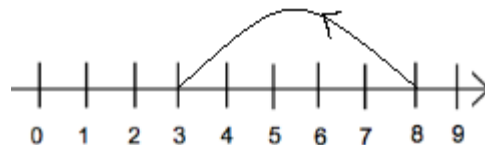
Total Marks: 80

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. Which of the following statements is shown by the given number line?



- A. $8 - 5 = 3$
B. $8 + 5 = 13$
C. $3 - 8 = -5$
D. $8 + 3 = 11$
2. $12 \times (45 + 30) =$
A. $(12 \times 45) + (12 \times 30)$
B. 12×65
C. $12 \times 45 \times 30$
D. $(12 \times 45) \times (12 \times 30)$
3. The sum of $267 + 132$ to nearest ten is
A. 500
B. 400
C. 300
D. 200

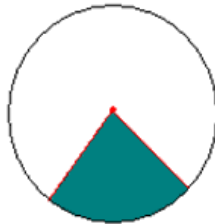
4. The greatest number that will divide 10 and 18 is

- A. 4
- B. 2
- C. 5
- D. 3

5. Mixed fraction for $\frac{5}{3}$ is

- A. $1\frac{2}{3}$
- B. $2\frac{2}{3}$
- C. $3\frac{2}{3}$
- D. $4\frac{2}{3}$

6. What does the shaded region in the following figure represent?



- A. Segment of a circle
- B. Radius of a circle
- C. Chord of a circle
- D. Sector of a circle

7. How many thousands make a crore?

- A. 10
- B. 100
- C. 1000
- D. 10000

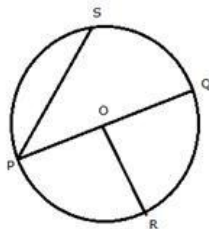
8. How many whole numbers are there up to 1000?

- A. 1001
- B. 1000
- C. 100
- D. 999

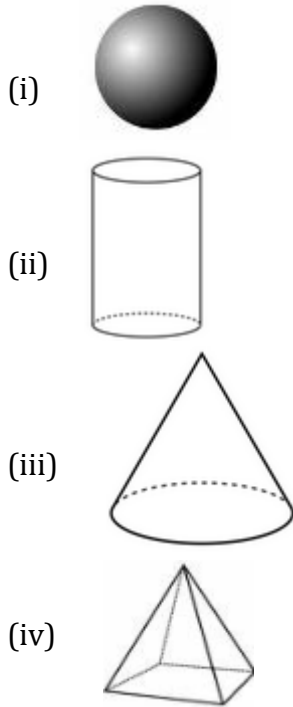
9. $(-42) + (-35) =$
A. -7
B. 7
C. -77
D. 41
10. Which is the fifth multiple of 18?
A. 80
B. 90
C. 72
D. 180
11. The improper fraction for $3\frac{1}{3}$ is _____
A. $\frac{10}{3}$
B. $\frac{3}{10}$
C. $\frac{1}{3}$
D. $\frac{3}{1}$
12. The English alphabet Z represents a/an _____ curve.
A. closed
B. open
C. polygon
D. triangle

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

13. Evaluate the difference between the place values of two 9's in the number 79520986.
14. Name all the radii drawn in the given figure.



15. How many vertices do the following shapes have?



16. Anna is standing on a rock that is 7 feet above sea level. She jumps off the rock and hits another rock 3 feet below and then walks 2 feet down. How many feet did she come down in all?

17. Find the sum: $(-13) + (-19) + (+15) + (-10)$.

18. Write a 9 digit number in Indian system (in Numerals) and then write it in words according to International system.

19. There is a line on which the points G, H and I lie such that H is in between G and I.

(i) If $\overline{GH} = 31$ and $\overline{HI} = 11$, then find \overline{GI} .

(ii) If $\overline{GH} = 45$ and $\overline{GI} = 61$, then find \overline{HI} .

20. Use divisibility test to determine whether the number 1258 is divisible by 6.

21. Subtract 3 from 8 using a number line.

22. Fill in the blanks with appropriate symbols '>' or '<'.

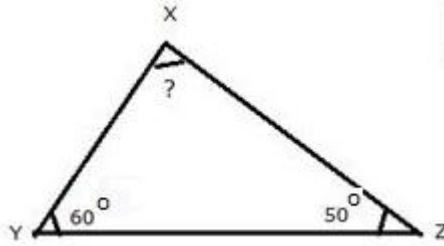
(i) -9 ___ -15

(ii) -10 ___ 10

(iii) 0 ___ 3

(iv) -28 ___ 17

23. In the following triangle, find the measure of $\angle X$.



24. Complete the following patterns by using the distributive property of multiplication over addition for whole numbers:

$$101 \times 33 = 3333$$

$$101 \times 333 = 33633$$

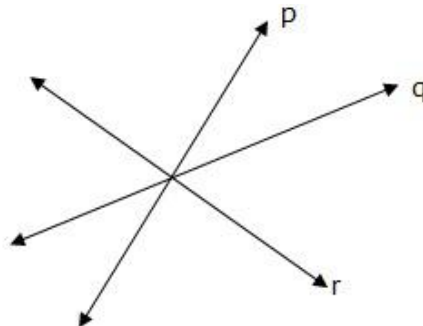
$$101 \times 3333 = ?$$

$$101 \times 33333 = ?$$

Section C

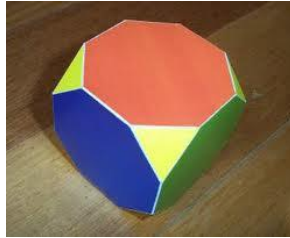
(Questions 25 to 32 carry 3 marks each)

25. Tanvi bought a notebook for Rs $8\frac{3}{4}$ and a pen for Rs $10\frac{2}{5}$. How much money should she pay to the shopkeeper?
26. Arrange the fractions $\frac{2}{3}$, $\frac{1}{6}$, $\frac{5}{9}$ and $\frac{7}{12}$ in ascending order.
27. The sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively. Find the sum of the reciprocals of the numbers.
28. Answer the following questions for the given figure.
- What are lines p, q, and r called?
 - What is the point at which they meet called? Label it on the figure.
 - How many lines can pass through the labeled point?

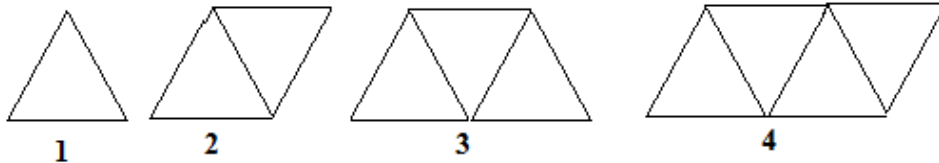


29. Compare the fractions $\frac{7}{12}$ and $\frac{9}{16}$.

30. Each corner of a cube is cut off, leaving a triangular face at each corner and an octagonal face in place of each face of the original cube. How many vertices and faces will the new polyhedron have?



31. Solve $(-8 + 12 - 2)$ using number line.
32. Shweta has made a chart on 'Elementary Shapes'. She develops a pattern for the border using sticks as follows:



Find a rule that helps her find the number of sticks.

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

33. The cost of a pen is Rs. $6\frac{2}{3}$ and that of a pencil is Rs. $4\frac{1}{6}$. Which costs more and by how much?
34. Name the type of the triangle:
- $\triangle LMN$ with $\angle L = 30^\circ$, $\angle M = 70^\circ$ and $\angle N = 80^\circ$.
 - $\triangle DEF$ with $\angle D = 90^\circ$.
 - $\triangle PQR$ such that $PQ = QR = PR = 5$ cm.
 - $\triangle XYZ$ with $\angle Y = 90^\circ$ and $XY = YZ$.
35. Simplify: $16 - [5 - 2 + \{7 \text{ of } 2 - (6 \div 3 \times 2 - 1 + 3)\}]$
36. Draw a rough figure and label the following statements:
- Line l contains point A but not B
 - Lines p and q intersect at point o
 - Rays PQ and QR meet to form angle PQR
37. Subtract the sum of $3\frac{5}{9}$ and $3\frac{1}{3}$ from the sum of $5\frac{5}{6}$ and $4\frac{1}{9}$.

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Solution

Time: 2 ½ hours

Total Marks: 80

Section A

1. Correct answer: A
On the given number line, from 8, five steps are moved towards the left.
Thus, the number line represents $8 - 5 = 3$.
2. Correct answer: A
According to distributive law of multiplication over addition, we have:
$$12 \times (45 + 30) = (12 \times 45) + (12 \times 30)$$
3. Correct answer: B
267 can be estimated as 270.
132 can be estimated as 130.
Thus the required estimated sum = $270 + 130 = 400$
4. Correct answer: B
We have
 $10 = 2 \times 5$
 $18 = 2 \times 3 \times 3$
HCF of 10 and 18 is 2.
Thus, 2 is the required number.
5. Correct answer: A
To convert into mixed fraction first divide numerator by denominator. The quotient is taken as the whole number part of mixed fraction. Remainder obtained is taken as the numerator and divisor as the denominator of the fractional part of the mixed fraction.
Therefore, $\frac{5}{3} = 1\frac{2}{3}$
6. Correct answer: D
A region in the interior of a circle enclosed by an arc on one side and a pair of radii on the other two sides is called a sector of the circle.

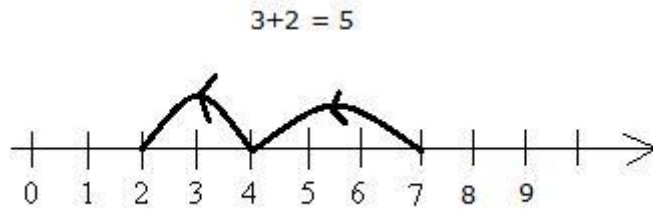
7. Correct answer: D
One crore can be written as 1,00,00,000.
One thousand can be written as 1000.
So, 10000 times one thousand would make one crore.
8. Correct answer: A
There are $1000 + 1 = 1001$ whole numbers upto 1000.
i.e., 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,, 1000
9. Correct answer: C
 $(-42) + (-35) = -42 - 35 = -77$
10. Correct answer: B
Fifth multiple of 18 = $18 \times 5 = 90$
11. Correct answer: A
 $3\frac{1}{3} = 3 + \frac{1}{3} = \frac{10}{3}$
12. Correct answer: B
The English alphabet Z represents an open curve.

Section B

13. Place value of 9 at the Ten Lakhs place = 9000000
Place value of 9 at the hundreds place = 900
Difference = $9000000 - 900 = 8999100$
14. Radius of a circle is a line joining the center of circle to any point on the circle. So, the radii drawn in the given figure are OP, OQ and OR.
15. The number of vertices in the given shapes:
(i) Sphere: 0
(ii) Cylinder: 0
(iii) Cone: 1
(iv) Pyramid: 5

16. Anna is 7 feet above sea level.

She jumps 3 feet down and walks another 2 feet down. Total distance travelled downwards = $3 + 2 = 5$ feet.



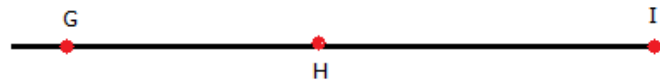
17. $(-13) + (-19) + (+15) + (-10)$
 $= -13 - 19 + 15 - 10$
 $= -13 - 19 - 10 + 15$
 $= -42 + 15$
 $= -27$

18. A 9-digit numeral in Indian system = 94,50,27,983

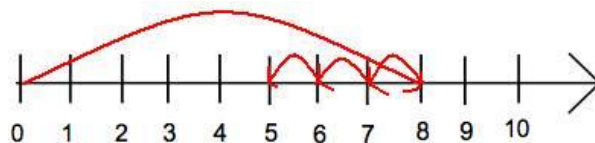
In International system:

945,027,983 - Nine hundred forty five million twenty seven thousand nine hundred eighty three.

- 19.



- (i) If $\overline{GH} = 31$ and $\overline{HI} = 11$
then, $\overline{GI} = \overline{GH} + \overline{HI} = 31 + 11 = 42$
- (ii) If $\overline{GH} = 45$ and $\overline{GI} = 61$
then, $\overline{HI} = \overline{GI} - \overline{GH} = 61 - 45 = 16$
20. Given number is 1258.
Its unit digit is 8, which is divisible by 2. So, 1258 is divisible by 2.
Sum of its digits = $1 + 2 + 5 + 8 = 16$, which is not divisible by 3.
So, 1258 is not divisible by 3.
Since, 1258 is divisible by 2 but not by 3, it is not divisible by 6.
21. Starting from zero, a jump of 8 units is made to the right to reach 8. Then, 3 jumps (each of 1 unit i.e. from 8 to 7, 7 to 6, 6 to 5) are taken to the left to reach 5.



So, we conclude that $8 - 3 = 5$

22.

- (i) $-9 > -15$
- (ii) $-10 < 10$
- (iii) $0 < 3$
- (iv) $-28 < 17$

23. Since the sum of all three angles of a triangle is 180° .

We have, $\angle X + \angle Y + \angle Z = 180^\circ$

Or, $\angle X + 60^\circ + 50^\circ = 180^\circ$

Or, $\angle X + 110^\circ = 180^\circ$

Or, $\angle X = 180^\circ - 110^\circ$

Hence, $\angle X = 70^\circ$

24. Using distributive property of multiplication over addition, we have:

$$101 \times 33 = (100 + 1) \times 33 = 3300 + 33 = 3333$$

$$101 \times 333 = (100 + 1) \times 333 = 33300 + 333 = 33633$$

$$101 \times 3333 = (100 + 1) \times 3333 = 333300 + 3333 = 336633$$

$$101 \times 33333 = (100 + 1) \times 33333 = 3333300 + 33333 = 3366633$$

Section C

25. Cost of notebook = Rs. $8\frac{3}{4}$ = Rs. $\frac{35}{4}$

Cost of pen = Rs. $10\frac{2}{5}$ = Rs. $\frac{52}{5}$

LCM of 4 and 5 = $(2 \times 2 \times 5) = 20$

Total cost of both the items

$$= \text{Rs.} \left(\frac{35}{4} + \frac{52}{5} \right)$$

$$= \text{Rs.} \left(\frac{35 \times 5}{20} + \frac{52 \times 4}{20} \right)$$

$$= \text{Rs.} \left(\frac{175}{20} + \frac{208}{20} \right)$$

$$= \text{Rs.} \frac{383}{20}$$

$$= \text{Rs.} 19\frac{3}{20}$$

26. The given fractions are $\frac{2}{3}$, $\frac{1}{6}$, $\frac{5}{9}$ and $\frac{7}{12}$.

3	3	6	9	12
2	1	2	3	4
	1	1	3	2

LCM of 3, 6, 9, 12 = $(3 \times 2 \times 3 \times 2) = 36$

So, we convert each one of given fractions into an equivalent fraction having 36 as denominator.

Now,

$$\frac{2}{3} = \frac{2 \times 12}{3 \times 12} = \frac{24}{36}$$

$$\frac{1}{6} = \frac{1 \times 6}{6 \times 6} = \frac{6}{36}$$

$$\frac{5}{9} = \frac{5 \times 4}{9 \times 4} = \frac{20}{36}$$

$$\frac{7}{12} = \frac{7 \times 3}{12 \times 3} = \frac{21}{36}$$

Clearly,

$$\frac{6}{36} < \frac{20}{36} < \frac{21}{36} < \frac{24}{36}$$

$$\text{Hence, } \frac{1}{6} < \frac{5}{9} < \frac{7}{12} < \frac{2}{3}$$

The given fractions in ascending order are $\frac{1}{6}$, $\frac{5}{9}$, $\frac{7}{12}$, $\frac{2}{3}$.

27. Let the numbers be a and b.

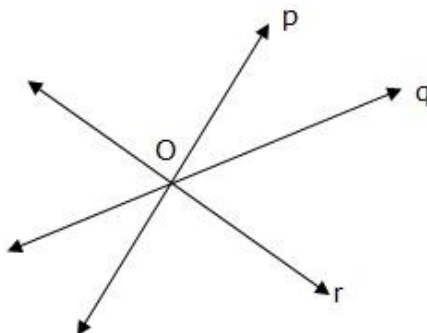
Then, $a + b = 55$ and $ab = 5 \times 120 = 600$

$$\text{Therefore, the required sum} = \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{55}{600} = \frac{11}{120}$$

28.

a) Lines p, q and r are intersecting lines.

b) Point at which the lines meet is called the point of intersection. The point O represents the point of intersection.



c) Infinite number of lines can pass through the point O (point of intersection).

29.

$$\begin{array}{c|cc} & 12 & 16 \\ \hline 4 & 3 & 4 \end{array}$$

LCM of 12 and 16 = $(4 \times 3 \times 4) = 48$

So, we convert each one of $\frac{7}{12}$ and $\frac{9}{16}$ into an equivalent fraction having 48 as denominator.

Now,

$$\frac{7}{12} = \frac{7 \times 4}{12 \times 4} = \frac{28}{48}$$

and

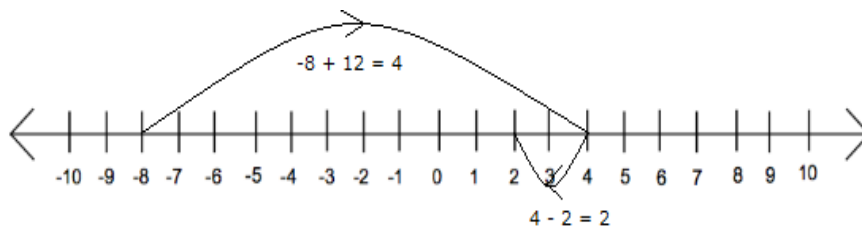
$$\frac{9}{16} = \frac{9 \times 3}{16 \times 3} = \frac{27}{48}$$

$$\text{Clearly, } \frac{28}{48} > \frac{27}{48}$$

$$\text{Hence, } \frac{7}{12} > \frac{9}{16}$$

30. Each of the 8 vertices of the cube has now been replaced by three vertices of a triangle. So, there are now 24 vertices. The cube had 6 square faces. Now those faces are still there but have become octagons. Additionally, there are now 8 new triangular faces. So, there is a total of 14 faces.

31. To solve using number line start with -8, move 12 steps right and then back 2 steps as shown below:



So, we reach at 2, therefore $(-8 + 12 - 2) = 2$

32. Let the number of triangles be n .

For 1 triangle: Number of sticks = $2 \times 1 + 1 = 3$ sticks

For 2 triangles: Number of sticks = $2 \times 2 + 1 = 5$ sticks

\therefore Number of sticks used = $2 \times n + 1$

Section D

33. Cost of a pen = Rs. $6\frac{2}{3}$ = Rs. $\frac{(6 \times 3) + 2}{3}$ = Rs. $\frac{20}{3}$

Cost of a pencil = Rs. $4\frac{1}{6}$ = Rs. $\frac{(4 \times 6) + 1}{6}$ = Rs. $\frac{25}{6}$

Now, converting to like fractions

$$\text{Rs. } \frac{20 \times 2}{3 \times 2} = \frac{40}{6}$$

Clearly,

$$\frac{40}{6} > \frac{25}{6} \text{ so, Rs. } 6\frac{2}{3} > \text{Rs. } 4\frac{1}{6}$$

Hence, the cost of pen is more than the cost of pencil.

$$\text{Difference between their cost} = \text{Rs. } \left(\frac{40}{6} - \frac{25}{6} \right)$$

$$= \text{Rs. } \left(\frac{40 - 25}{6} \right)$$

$$= \text{Rs. } \frac{15}{6}$$

$$= \text{Rs. } 2\frac{3}{6}$$

$$= \text{Rs. } 2\frac{1}{2}$$

Hence, the cost of pen is more than cost of pencil by Rs. $2\frac{1}{2}$

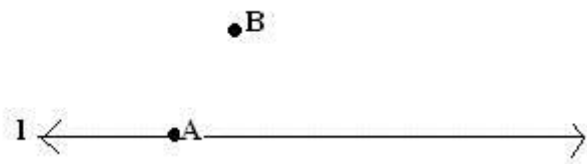
34.

- (i) Scalene triangle. Because none of the angles are equal, none of the sides will also be equal. Hence, it is a scalene triangle.
- (ii) Right-angled triangle. Because the given angle is 90° , it is a right-angled triangle.
- (iii) Equilateral triangle. Because all the sides of the given triangle are equal, it is an equilateral triangle.
- (iv) Isosceles right-angled triangle. Since two sides are equal ($XY = YZ$) and one angle is 90° , it is an isosceles right-angled triangle.

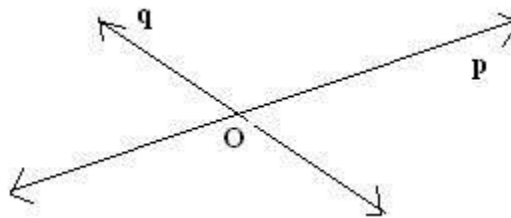
35. $16 - [5 - 2 + \{7 \text{ of } 2 - (2 \times 2 - 1 + 3)\}]$
 $= 16 - [5 - 2 + \{7 \text{ of } 2 - (4 - 1 + 3)\}]$
 $= 16 - [5 - 2 + \{7 \text{ of } 2 - 6\}]$
 $= 16 - [5 - 2 + \{8\}]$
 $= 16 - 11$
 $= 5$

36.

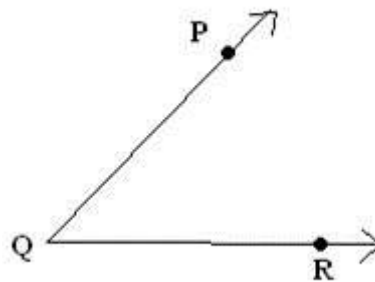
- a. Line l contains point A but not B



- b. Lines p and q intersect at point O



- c. Rays PQ and QR meet to form angle PQR



37.

Adding $3\frac{5}{9} + 3\frac{1}{3}$

$$= \frac{32}{9} + \frac{10}{3}$$

LCM of 3, 9 = 9

$$= \frac{32 + (10 \times 3)}{9}$$

$$= \frac{32 + 30}{9}$$

$$= \frac{62}{9}$$

We also have

Adding $5\frac{5}{6} + 4\frac{1}{9}$

LCM of 6, 9 = $(2 \times 3 \times 3) = 18$

$$= \frac{35}{6} + \frac{37}{9}$$

$$= \frac{(35 \times 3) + (37 \times 2)}{18}$$

$$= \frac{105 + 74}{18}$$

$$= \frac{179}{18}$$

Thus,

$$\frac{179}{18} - \frac{62}{9}$$

$$= \frac{179 - 62 \times 2}{18}$$

$$= \frac{179 - 124}{18}$$

$$= \frac{55}{18}$$

$$= 3\frac{1}{18}$$