Maharashtra State Board
Class VI Mathematics
Sample Paper 3
Solution

Time: 2 hr 30 min **Total Marks: 60**

Q1.

1. $-8 \leq -5$

2. The same number has been added to both sides of the equality.
   Hence, this is called the addition property of an equality.

3. A triangle with all three sides of different lengths is called a scalene triangle.
   $\therefore$ ΔDEF is a scalene triangle.

4. $0.400 = 0.40 = \frac{40}{100} = 40\%$

5. Line segments QR and ST are the chords of the circle.

6. The opposite of +27 is −27.

7. The sum of the lengths of any two sides of a triangle is **greater** than the length of the third side.

8. $10x + 5x + (-7x)$
   $= 15x - 7x$
   $= 8x$

9. Area of the bed sheet = length x breadth = 2.5 m x 2 m = 5 sq. m

10. 40 cubes each of side 1 cm are fitted into a cuboidal box.
    Hence, the volume of the box is **40 cu. cm**.

11. $4m^2n + 7nm^2$
    $= 4m^2n + 7m^2n$ ($7nm^2$ is same as $7nm^2$)
    $= (4 + 7)m^2n$
    $= 11m^2n$

12. Principal = Rs. 6,00,000
    Interest = Rs. (840000 − 600000) = Rs. 2,40,000
    Period = 5 years.

Q2.

1. Original measurements of the photo:
   Length = 16 cm
   Breadth = 12 cm
   The new measurements of the cropped photo will be
   Length = 16 ÷ 2 = 8 cm
   Breadth = 12 ÷ 2 = 6 cm
   Area of the cropped photo = length × breadth = 8 cm × 6 cm = 48 cm^2
   Hence, the area of the cropped photo is 48 cm^2.

2. Maximum marks = 600
   40% of maximum marks are needed for passing.
   $\text{Now, } 40\% \text{ of } 600 = \frac{40}{100} \times 600 = 240$
   Hence, the passing marks of the exam are 240.

3. $5x^2 + x$
   $= 5(3)^2 + 3$
   $= 5(9) + 3$
   $= 45 + 3$
   $= 48$

4. Length of a box = l = 40 cm
   Breadth of a box = b = 30 cm
   Volume of a box = 24000 cm^3
   Now, volume = l × b × h
   ∴ 24000 = 40 × 30 × height
   ∴ 24000 = 1200 × height
   $\therefore h = \frac{24000}{1200} = 20$
   Hence, the height of the box is 20 cm.

5. L.H.S = 5
   $\text{R.H.S} = \frac{35}{x} = \frac{35}{7} = 5$
   Since, L.H.S. = R.H.S., x = 7 is the solution of the given equation.

6. By the property of exterior angle of a triangle, we have
   m∠ TRM = m∠ N + m∠ T
   ∴ m∠ TRM = 30° + 80° = 110°

7. Length of the tank = l = 2.5 m
   Breadth of the tank = b = 2 m
   Height of the tank = h = 3 m
   Volume of the tank = l × b × h = 2.5 × 2 × 3 = 15 cu. m
   Volume of water which the tank can hold = Volume of the tank.
   Thus, the tank can hold 15 cu. m of water.

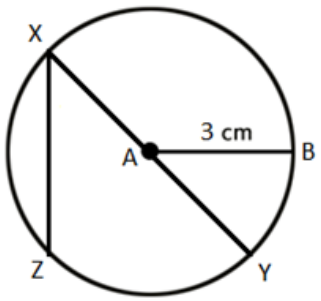
8. We know that the diameter of a circle = 2 × radius
   By applying the formula, we get
   (i) Radius = 9 cm
   ∴ Diameter = 2 × 9 = 18 cm

   (ii) Radius = 3.6 cm
   ∴ Diameter = 2 × 3.6 = 7.2 cm

Q3.

1. The period and the rate of interest remain the same.
   The new principal Rs. 6000 is $\frac{1}{3}$ the old principal of Rs. 18000.
   ∴ Interest will also be $\frac{1}{3}$ times of Rs. 3240.
   ∴ Interest on Rs. 6000 $=$ Rs. $\left(3240 \times \frac{1}{3}\right) =$ Rs. 1080

2. Mark point A. Take point A as the centre and draw a circle with radius 3 cm using a compass.



   The radius is the distance between the centre and any point on the circumference.
   ∴ AB is the radius of the circle.

   The diameter is the chord which divides the circle into two halves.
   ∴ XY is the diameter of the circle.

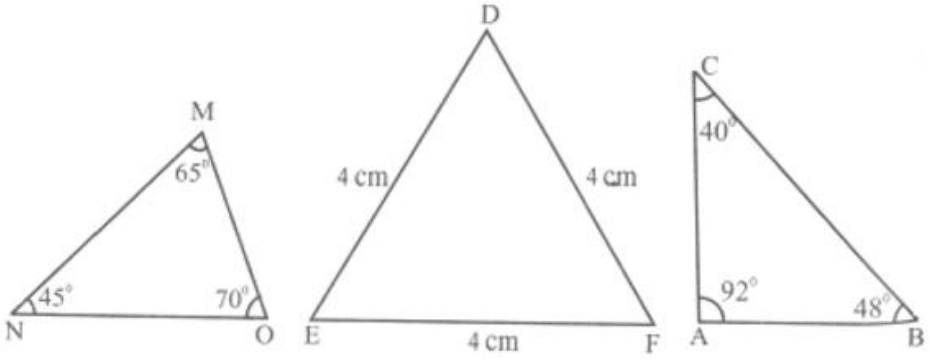
   A line segment which joins any two points on the circumference of a circle is called a chord.
   ∴ XZ is a chord of the circle.

3. Length of a rectangle = l = 4 m
   Breadth of a rectangle = b = 3 m
   Area of a rectangle = length x breadth
   = 4 × 3
   = 12 sq. m

   Side of a square = 5 m
   Area of square land = side x side
   = 5 x 5
   = 25 sq. m

   Area of remaining part of the land
   = Area of a square land – Area of a rectangle
   = 25 – 12
   = 13 sq. m

4.



   ΔMNO is an acute angled triangle as all its angles are acute angles.
   ΔDEF is an equilateral triangle as all its sides are equal in length.
   ΔABC is an obtuse angled triangle as one of its angles measures 92°.

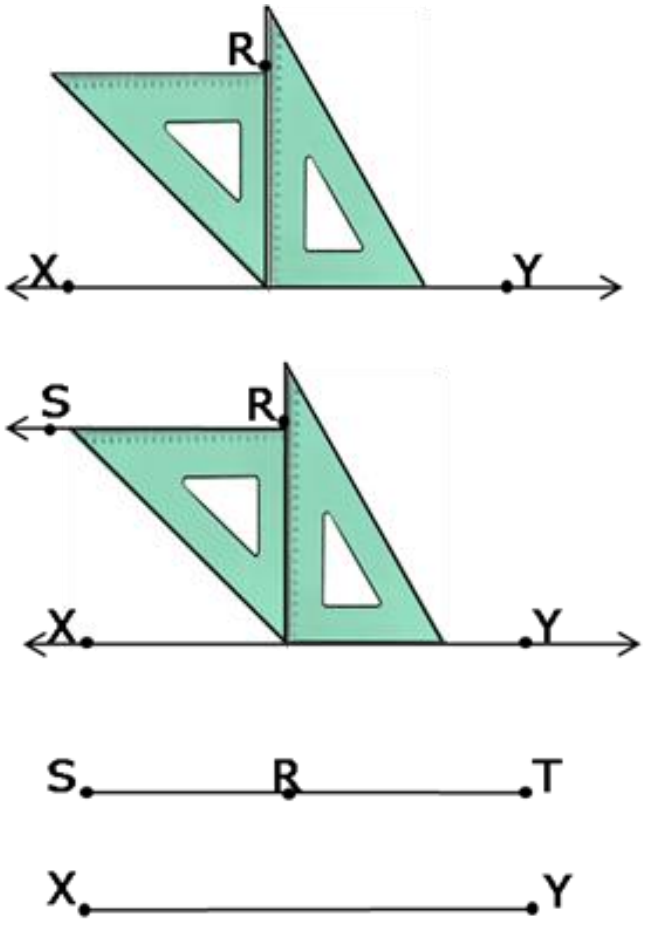
5. **Addition in horizontal arrangement:**
   (3mn + 6n – 5m) + (−2m − 8mn + 7n)
   = (3mn – 8mn) + (6n + 7n) + (−5m – 2m)
   = −5mn + 13n – 7m

   Addition in vertical arrangement:

	3mn	+	6n	–	5m
+	−8mn	+	7n	–	2m
	−5mn	+	13n	–	7m

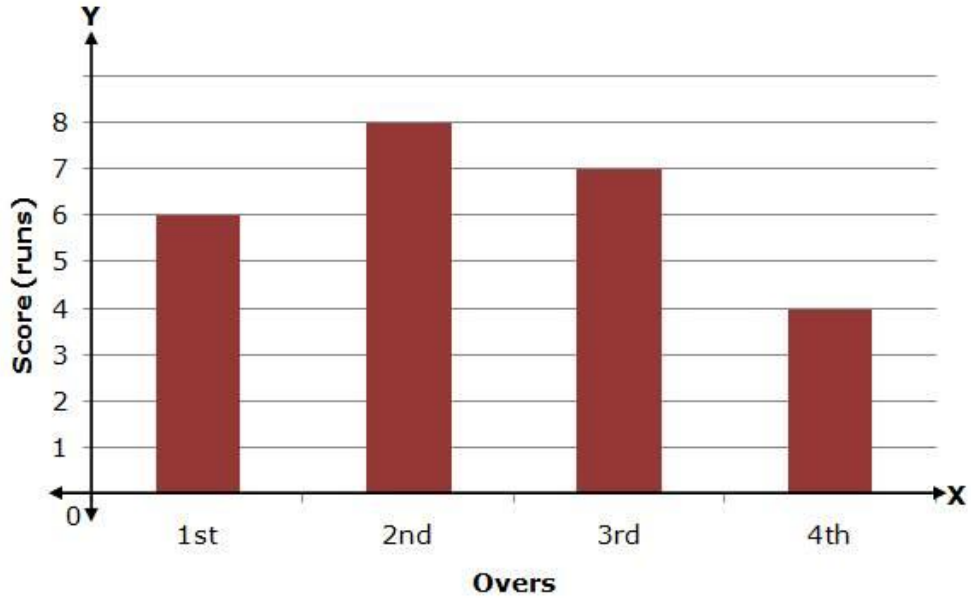
6. The sum of the lengths of any two sides of a triangle is greater than the length of the third side.
   (i) l(AP) + l(BP) > l(AB)
   (ii) l(AP) + l(CP) ≥ l(AC)
   (iii) l(BP) + l(CP) > l(BC)

7. Steps of construction:
   1. Draw a line XY.
   2. Take a point R outside line XY.
   3. Place one side of the right angle of the set square along the line XY and let the other side of the right angle pass through point R.
   4. Take another set square. Place one side of the right angle of the second set square along the side of the first set square which is perpendicular to line XY with the other side parallel to line XY.
   5. Now, keeping the first set square in its place, move the second one so that the vertex of its right angle falls on point R.
   6. Draw a line ST through point R along the free side of the right angle of the second set square.
      Thus, line ST passes through point R and is parallel to line XY.

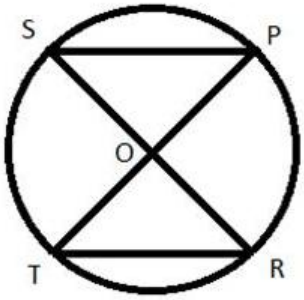


Q4.

1.



2.



(i) An arc is any part of the circumference of a circle.
Hence, the three arcs in the given circle are as follows:
Arc PRT, Arc SPR, Arc STR

(ii) The radius is the distance between the centre and any point on the circumference.
The radii shown in the given circle are as follows:
Radius OP, Radius OS, Radius OR, Radius OT

(iii) The diameter is the chord which divides the circle into two halves.
Hence, Chord SR and Chord PT divide the circle into two halves.

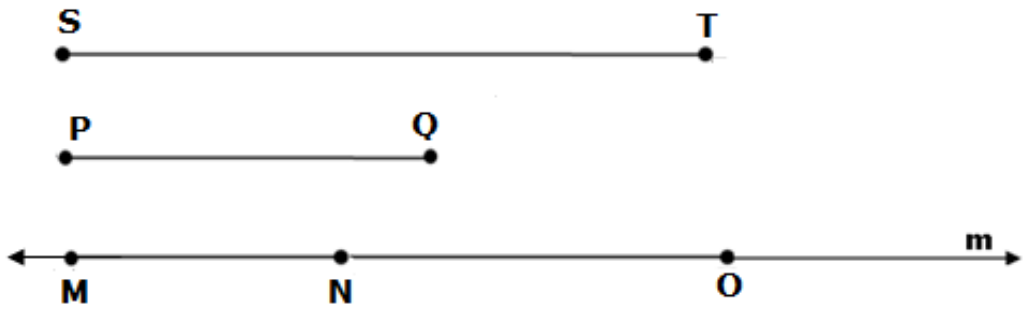
(iv) A line segment joining any two points on the circumference of a circle is called a chord.
The four chords of the given circle are as follows:
Chord SR, Chord PT, Chord SP, Chord TR

3. $[(15) \times (2) + (-4) \times (5)] \div (-5)$
   $= [(30 + (-20)] \div (-5)$ (multiplication)
   $= (30 - 20) \div (-5)$
   $= 10 \div (-5)$ (subtraction)
   $= -2$ (division)

4. Rate of interest is 8 p.c.p.a.
   $\therefore$ Interest on a principal of Rs. 100 for 1 year = Rs. 8
   $\therefore$ Interest on a principal of Rs. 100 for 4 years = 8×4 = Rs. 32.
   Now, 15000 is 150 times Rs. 100.
   $\therefore$ Interest on Rs. 15000 for 4 years = Rs. (32×150) = Rs. 4800.

5. Steps of construction:
   1. First draw two segments ST and PQ of unequal lengths.
   2. Draw another line m.
   3. Take a point M on line m.
   4. Open the divider to a span equal to the length of the longer of the two segments ST and PQ. Hence, first take a span equal to length of seg ST.
   5. Without changing the span, place one tip of the divider on point M and mark O, the point on the line m where its other tip falls.
   6. Now, take a distance equal to the length of seg PQ between the tips of the divider.
   7. Place one tip of the divider on point O and bring the other tip down on the line m on the same side as point M. Mark this as point N.

   Now, segment MN is equal in length to the difference between the lengths of seg ST and seg PQ.



Q5.

1. 1 hectare = 10,000 sq. m

   $\therefore$ 3 hectares = 30,000 sq. m

   19500 out of 30000 is expressed as $\frac{19500}{30000}$.

   We have to convert it into equivalent fraction with denominator 100.

   So we divide both the numerator and denominator by 300.

   $\therefore \frac{19500}{30000} = \frac{19500 \div 300}{30000 \div 300}$

   $= \frac{65}{100}$

   $= 65\%$

   Hence, Namdev sowed jowar in 65% of his total land.

2.