25. The base and altitude of a right angled triangle are 12 cm and 5 cm respectively. The perpendicular distance of its hypotenuse from the opposite vertex is—

(A) $4\frac{4}{13}$ cm (B) $4\frac{8}{13}$ cm

(C) 5 cm (D) 7 cm

26. A circle is inscribed in an equilateral triangle of side 8 cm. The area of the portion between the triangle and the circle is—

(A) 11 cm^2 (B) 10.95 cm^2

(C) 10 cm^2 (D) 10.50 cm^2

27. A rectangular plot of grass is 80 metres long and 60 m broad. From the centre of each side a path of 3 metre wide goes across the centre of the opposite side. Find the area of these path.

(A) 420 m^2 (B) 411 m^2

(C) 402m^2 (D) none

28. If the diagonals of two squares are in the ratio 2 : 5, then their areas will be in the ratio

(A) $\sqrt{2} : \sqrt{5}$ (B) 2 : 5

(C) 4 : 25 (D) 4 : 5

29. The radius of a circular wheel is 1.75 m. The number of revolutions that it will make in covering 11 kms is

(A) 1000 (B) 10,000

(C) 100 (D) 10

30. The difference between the length and the breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is

(A) 1520 m^2 (B) 2420 m^2

(C) 2480m^2 (D) 2520 m^2

31. Sides of a triangle are 15 cm, 13 cm and 14 cm. Find the area of triangle.

(A) 84 cm^2 (B) 48 cm^2

(C) 168 cm^2 (D) 42 cm^2

32. Mid-points of a triangle containing sides 12 cm, 18 cm and 26 cm are joined to each-other. Find the area of triangle formed by the mid-points.

(A) $4\sqrt{5}$ cm^2 (B) $2\sqrt{7}$ cm^2

(C) $4\sqrt{35}$ cm^2 (D) $8\sqrt{35}$ cm^2

33. Perimeter of a rectangle is 56 cm and length is 15 cm. Find the area of rectangle.

(A) 195 cm^2 (B) 189 cm^2

(C) 225 cm^2 (D) 215 cm^2

34. Diagonal of a rectangle is 25 cm and length is 20 cm. Find the area of rectangle.

(A) 200 cm^2 (B) 400 cm^2

(C) 500 cm^2 (D) 300 cm^2

35. Length and breadth of rectangular field are in the ratio 3 : 2. If perimeter of field is 100 m. Find the length of the field.

(A) 20 m (B) 30 m

(C) 10 m (D) 50 m

36. The area of a square is 256 m^2. Find its diagonal.

(A) 18 m (B) $16\sqrt{2}$ m

(C) 32 m (D) $8\sqrt{2}$ m

37. The ratio of two square's area is 9 : 1. find the ratio between their perimeters.

(A) 1 : 3 (B) 9 : 1

(C) 1 : 9 (D) 3 : 1

38. Diagonals of rhombus are 16 cm and 12 cm. Find its area.

(A) 84 cm^2 (B) 96 cm^2

(C) 48 cm^2 (D) 36 cm^2

39. Find the perimeter of a rhombus, the diagonals of which are 40 cm and 30 cm respectively.

(A) 100 cm (B) 140 cm

(C) 200 cm (D) 70 cm

40. The side of a rhombus is 5m. if one diagonal is 8m. Find the area of the rhombus.
(A) 24 cm^2 (B) 36 cm^2
(C) 42 cm^2 (D) 48 cm^2

41. Area of a hexagon is $54\sqrt{3}$ cm^2. Find its side.
(A) 7 cm (B) 6 cm
(C) 8 cm (D) 9 cm

42. A room 10 m long and 8 m wide is to be designed by square tiles of maximum area. Find the number of square tiles.
(A) 10 (B) 20
(C) 25 (D) 30

43. The areas of a rectangles and a square are same. if length and breadth are 90 m and 80 m. Then find the side of square.
(A) 60 m (B) $60\sqrt{2}$ m
(C) 90 m (D) $90\sqrt{2}$ m

44. A rectangular field is 25m long and 20 m side. Find the area of a greatest square drawn in it.
(A) 200 m^2 (B) 400 m^2
(C) 800 m^2 (D) 400 m

45. Find the area of greatest circle which can be inscribed in a rectangle with sides 18 cm and 14 cm.
(A) 154 cm^2 (B) 77 cm^2
(C) 231 cm^2 (D) 451 cm^2

46. A circular bed is made in a square field with side of 35m. Find the area of circular bed.
(A) 862.5 m^2 (B) 962.5 m^2
(C) 826.5 m^2 (D) 926.5 m^2

47. A circular wire, of radius 56 cm is bent into the shape of a square. Find the side of the square.
(A) 44 cm (B) 22 cm
(C) 88 cm (D) 176 cm

48. The perimeters of a circular field and of a square are same. If the area of square field is 121m^2. Find the radius of the circle.
(A) 7 cm (B) 14 cm
(C) 21 cm (D) 10.5 cm

49. The length of a square is decreased by 20%. Find the % increase in the width of square that its area would not be changed.
(A) 20% (B) 23%
(C) 27% (D)25%

50. The length and breadth of a rectangular plot are increased by 10% and 5%. By what percent will its area increase?
(A) 15.5% (B) 16.5%
(C) 17.5% (D) 14.5%

51. The length and breadth of a rectangle are decreased by 20% and 15%. Find the percent change in its area.
(A) 15% increase (B) 12% decrease
(C) 12 % increase (D) 32% decrease

52. The length of a rectangle is increased by 18%, while breadth is decreased by 12%. Find the percent increase/ decrease in its area.
(A) 2.4 % increase (B) 4.8% decrease
(C) 4.8% increase (D) 2.4 decrease

53. A garden is 75 m long and 60 m wide. There is a way 5m wide parallel to length of garden in its mid. Find the area of the way.
(A) 300 m^2 (B) 325 m^2
(C) 375 m^2 (D) 400 m^2

54. There are two paths each 10 m wide and cut each other perpendicularly at the mid of a garden 150 m long and 120 m wide. Find the cost of graveling the path at ₹ 2/m^2.
(A) ₹ 5200 (B) ₹ 4800
(C) ₹ 5600 (D) ₹ 4400

55. A rectangular plot 80 m has a sitting place 10 m wide around it on the outside. Find the area of the sitting place.
(A) 3300 m^2 (B) 3500 m^2
(C) 3700 m^2 (D) 3900 m^2

56. The radius of a circle inscribed to a square is $2\sqrt{7}$ cm. Find the area of the circum-circle to the square.
(A) 176 cm^2 (B) 88 cm^2
(C) 352 cm^2 (D) 132 cm^2

57. Three circles are described with the radius 5 cm at the corners of a equilateral triangle as the centres, so that each touches the other two. Find the common area to the triangle and circles.
(A) 3.75 cm^2 (B) 4.2 cm^2
(C) 4.55 cm^2 (D) 37.5 cm^2

58. On the vertex of a square, taking as centres, 4 circles are drawn so that each touches two of all. Another circle touching all 4 circles is also drawn. If the side of the square is 24 cm find the area of another circle.
(A) 23.04 cm^2 (B) 23.06 cm^2
(C) 17.68 cm^2 (D) 13.52 cm^2

59. Find the diagonal of a rectangle whose sides are 12 meters and 5 meters.
(A) 13 m (B) 26 m
(C) 17 m (D) 7 m

60. An oblong piece of ground measures 19 meters 2.5 dm by 12 metres 5 dm. From the centre of each side a path 2 meters wide goes across to the centre of the opposite side. Find the cost of paving these paths at the rate of ₹ 12.32 P per sq meter.
(A) ₹ 7430.68 (B) ₹ 713.04
(C) ₹ 753.26 (D) ₹ 733.04

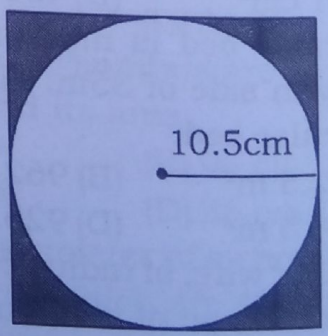
61. How long will a man take to walk round the boundary of a square field containing 9 hectares at the rate of 6 km an hour?
(A) 9 minutes (B) 12 minutes
(C) 15 minutes (D) 10 minutes

62. A square field of 2 sq km is to be divided into two equal parts by a fence which coincides with a diagonal. Find the length of the fence.
(A) 2 km (B) 200 km
(C) 2000 km (D) 20 km

63. A rectangular lawn 80 m × 60 m has two roads each 10 m wide running in the middle of it, one parallel to the length and the other parallel to the breadth. Find the cost of gravelling them at ₹ 30 per square metre.
(A) ₹ 54,000 (B) ₹ 33,000
(C) ₹ 36,000 (D) ₹ 39,000

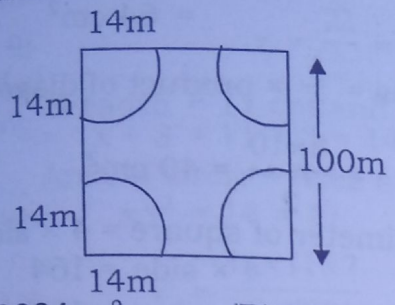
64. ΔABC and ΔDEF are similar triangles such that BC = 4 cm, EF = 5 cm and area (ΔABC) = 64 cm^2. The area of ΔDEF is :
(A) 80 cm^2 (B) 100 cm^2
(C) $51\frac{1}{5}$ cm^2 (D) None of these

65. What is the area of the shaded portion if each side of the square measures 21 cm?



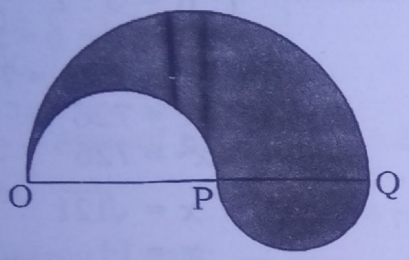
(A) 86.5 cm^2 (B) 102 cm^2
(C) 94.5 cm^2 (D) 81.5 cm^2

66. A square park has each side 100 m. At each corner of the park there is a flower bed in the form of a quadrant of radius 14 m, as shown in the figure. The area of the remaining part of the park is :



(A) 9384 m^2 (B) 9290 m^2
(C) 9150 m^2 (D) 9050 m^2

67. In the given figure, OP = PQ = 14 cm and semicircles are drawn on OP, PQ and OQ as diameters. Then, the perimeter of the shaded area is :



(A) 88 cm (B) 176 cm
(C) 264 cm (D) 352 cm

68. The area of a trapezium is 384 cm^2. If its parallel sides are in the ratio 3 : 5 and the perpendicular distance between them is 12 cm, the smaller of the parallel sides is
(A) 16 cm (B) 24 cm
(C) 32 cm (D) 40 cm

69. The cross-section of a canal is a trapezium in shape. If the canal is 10 m wide at the top and 6m wide at the bottom and the area of the cross-section is 640 m^2, the length of the cross-section is
(A) 40 m (B) 80 m
(C) 160 m (D) 384 m

70. The circumference of a circular field is 440 m. A circular path of 10 metre width runs around the outside of the field. Find the cost of cultivating the path at the rate of 70 paise per square metre.
(A) ₹ 2200 (B) ₹ 3300
(C) ₹ 264 (D) none of these

Exercise

Fill in the blanks

1. Area of circle =.....
2. Perimeter or Rectangle =.....
3. Area of Rhombus =.....
4. Area of Square =.....
5. Diagonal of Square =.....
6. Circumference of Circle =.....
7. Perimeter of Square =.....
8. Area of Equilateral triangle =.....
9. Area of Parallelogram =.....
10. Area of Trapezium =.....

Solution

1.(A) Let length of rectangle = x

Then breadth = $\frac{x}{2}$

According to the question,

$$x \times \frac{x}{2} = 578$$

or, $x^2 = 1156$

$\therefore$ $x = \sqrt{1156} = 34$ m

2.(B) Let the radius of circle be r cm.

$\therefore$ $2\pi r = 88$

$\Rightarrow$ $2 \times \frac{22}{7} \times r = 88$

$\Rightarrow$ $r = \frac{88 \times 7}{2 \times 22} = 14$ cm

$\therefore$ Area $= \pi r^2$

$= \frac{22}{7} \times 14 \times 14$

$= 616$ cm^2

3.(B) Area of square = (side)^2 = $(25)^2$

= 625 sq cm

Area of rectangle = 625 – 125

= 500 sq cm

$\therefore$ Breadth of rectangle

$= \frac{500}{25} = 20$ cm

4.(C) $A = p(4x)^2 = p\ 16x^2$

$A_2^1 = \pi(5x)^2 = \pi\ 25x^2$

Percentage decrease $= \frac{\pi 9x^2}{\pi 25x^2} \times 100$

$= 36\%$

5.(A) Required number of poles

$$= \frac{\text{Perimeter}}{\text{Distance between any two adjacent poles}}$$

$= \frac{84}{1.5} = 50$

6.(A) Surface area = Height × Base

= 6.4 × 10

= 64 cm^2

7.(C) Area = $\frac{1}{2}$ × product of diagonals

$= \frac{8 \times 10}{2} = 40$ cm^2

8.(D) Perimeter of square = 4 × side

$\Rightarrow$ 4 × side = 164

$\Rightarrow$ Side $= \frac{164}{4} = 41$ m

$\therefore$ Area = (side)^2 = $(41)^2$

= 1681 sq m

9.(A) Let l and b be the length and breadth of rectangular field.

l : b = 3 : 2

$\Rightarrow$ $l = 3x$; $b = 2x$

area = $l \times$ b = 726

$3x \times 2x = 726$

$6x^2 = 726$

$x = \sqrt{121}$

$x = 11$

$l = 33$, $b = 22$

10.(D) Let the length and breadth of the rectangular field be $14x$ and $11x$ metres respectively.

$\therefore$ $2(14x + 11x) = 100$

$\Rightarrow$ $50x = 100$

$\Rightarrow$ $x = \frac{100}{50} = 2$

$\therefore$ Area of rectangular field

= 28 × 22

= 616 m^2

$\therefore$ Area of circular field = 616 m^2

$\pi r^2 = 616$

$r = \sqrt{\frac{616}{\pi}} = \sqrt{\frac{616}{1} \times \frac{7}{22}}$

$r = 14$ m

$d = 2r = 28$ m

11.(D) Let the breadth of the rectangle be x cm

$\therefore$ Length $= (x + 3)$ cm

Now,

$2(x + x + 3) = 50$

$\Rightarrow 2x + 3 = 25$

$\Rightarrow 2x = 22$

$\Rightarrow x = \frac{22}{2} = 11$

$\therefore$ Breadth $= 11$ cm and length $= x + 3 = 11 + 3 = 14$ cm

$\therefore$ Area of circle = Area of rectangle

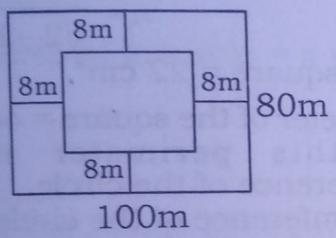
$\Rightarrow \pi r^2 = 14 \times 11$

$\Rightarrow r^2 = \frac{14 \times 11 \times 7}{22}$

$\Rightarrow r = 7$ cm

$\therefore$ Diameter $= 14$ cm

12.(A)



Area of path $= 100 \times 80 - 84 \times 64$

$= 8000 - 5376$

$= 2624$ m^2

13.(B) Area of path

$= 2$(width of path) $\times$ [length + breadth of plot $-$ 2(width)]

$= 2 \times 2.5 \times (112 + 78 - 2 \times 2.5)$

$= 5 \times 185 = 925$ sq m

$\therefore$ cost of construction $=$ Rate $\times$ Area

$= 2 \times 925$

$= ₹\ 1850$

14.(D) Area of field $= 31684$ sq m

$\therefore$ perimeter $= \sqrt{31684} \times 4$ m

$= 178 \times 4$ m

$\therefore$ length of each circuit

$= 178 \times 4 \times \frac{105}{100}$ m

Since the wire goes round 4 times,

$\therefore$ Total length of wire required

$= 178 \times 4 \times \frac{105}{100} \times 4$ m

$= 2990.4$ m

15. (B) Here $a = 50$ metres,

$b = 78$ metres,

$c = 112$ metres

$\therefore s = \frac{1}{2}(50 + 78 + 112)$ m

$= \frac{1}{2} \times 240$ m

$= 120$ m

$\therefore s - a = (120 - 50)$ m $= 70$ m

$s - b = (120 - 78)$ m $= 42$ m

$s - c = (120 - 112)$ m $= 8$ m

$\therefore$ area $= \sqrt{120 \times 70 \times 42 \times 8}$ sq m

$= 1680$ sq m

Perpendicular $= \frac{2 \times \text{Area}}{\text{Base}}$

$= \frac{1680 \times 2}{112}$ m

$= 30$ m

16.(A) Area $= \frac{1}{2} \times$ height $\times$ (sum of parallel sides)

or, $250 = \frac{1}{2} \times$ height $\times (15 + 10)$

or, height $= \frac{250 \times 2}{25}$

$\therefore$ height $= 20$ m

17.(A) Let radius of circular garden is R.

Circumference of garden

$2\pi R = 1012$ m^2

$R = \frac{1012}{2\pi}$ m

$= \frac{1012 \times 7}{2 \times 22}$ m

$= 161$ m

Outer radius of circular path

$= 161 + 3.5 = 164.5$ m

Area of path $= \pi (164.5)^2 - \pi(161)^2$

$= \pi \times 325.5 \times 3.5$

$= 3580.50$ m^2

$\therefore$ Cost of gravelling

$= 3580.5 \times 0.32$

$= ₹\ 1145.76$

18.(C) Let the length and breadth of the rectangle be x and y.
Then,

its area $= xy$

$$\text{New length} = x\left(\frac{160}{100}\right) = \frac{8x}{5}$$

As the area remains the same, the new breadth of the rectangle

so $\frac{8x}{5} \times \text{New width} = xy$

$$\text{New width} = \frac{xy}{\frac{8x}{5}} = \frac{5y}{8}$$

$\therefore$ decrease in breadth $= y - \frac{5y}{8}$

$$= \frac{3y}{8}$$

$\therefore$ % decrease in breadth $= \frac{3y \times 100}{8 \times y}$

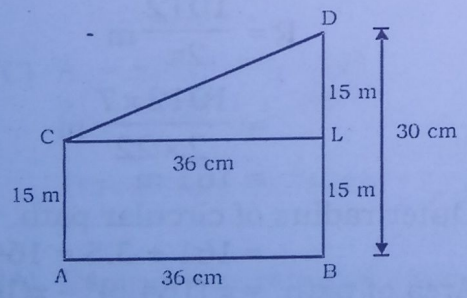
$$= \frac{75}{2}\%$$

$$= 37\frac{1}{2}\%$$

19.(A) From the figure it is required to find the length CD.

We have CA = LB = 15 m

$\therefore$ LD = BD – LB = 15 m



$\therefore$ $CD = \sqrt{CL^2 + DL^2}$

$= \sqrt{36^2 + 15^2}$

$= \sqrt{1521}$

$= 39$ cm

20.(A) From the question we have,

$$\frac{\pi(r-n)^2}{\pi r^2} = \frac{1}{2}$$

or, $r^2 = 2(r-n)^2$

or, $r^2 - \{\sqrt{2}(r-n)\}^2 = 0$

or, $\{r - \sqrt{2}(r-n)\}\{r + \sqrt{2}(r-n)\} = 0$

Since $r + \sqrt{2}(r-n) \neq 0$, we have

$r - \sqrt{2}(r-n) = 0$

$r - \sqrt{2}r + r - \sqrt{2}n = 0$

$r - \sqrt{2}r + \sqrt{2}n = 0$

$\sqrt{2}n = \sqrt{2}r - 1$

$\sqrt{2}n = r(\sqrt{2} - 1)$

$$n = \frac{\sqrt{2}n}{\sqrt{2} - 1}$$

21.(C) Area of square = 22 cm^2

$\therefore$ Perimeter of the square = $4\sqrt{22}$ cm

Now, this perimeter is the circumference of the circle.

$\therefore$ Circumference of the circle

$= 2\pi r = 4\sqrt{22}$

$\therefore$ $r = \frac{2\sqrt{22}}{\pi}$

$\therefore$ Area of the circle $= \pi r^2$

$$= \pi\left(\frac{2\sqrt{22}}{\pi}\right)^2 = \frac{\pi \times 4 \times 22}{\pi^2}$$

$$= \frac{4 \times 22}{\pi} = \frac{4 \times 22 \times 7}{22}$$

$= 28$ cm^2

22.(D) In any quadrilateral,

Area of the quadrilateral

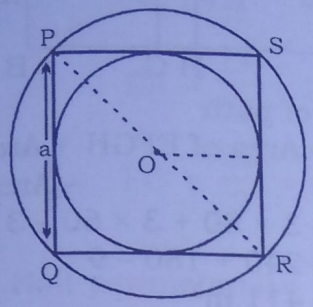
$= \frac{1}{2} \times$ any diagonal $\times$ (sum of perpendiculars drawn on diagonal from two vertices)

$= \frac{1}{2} \times D \times (P_1 + P_2)$

$= \frac{1}{2} \times 23 \times (17 + 7)$

$= 2 \times 23 = 276$ sq cm

23. (A) Let PQRS be any square of length 'a' cm and 'O' be the centre of the two circles drawn inside (in-circle) and outside (cirum-circle) the square.



$\therefore$ Radius of the in circle
= Half the length of one side (PQ) of the square $= \left(\frac{a}{2}\right)^2$ cm

$\Rightarrow$ Area of in-circle $= \pi \times \left(\frac{a}{2}\right)^2$

$= \left[\frac{\pi a^2}{4}\right]$ cm^2

And the radius of circum-circle
= Half the length of the diagonal (PR) of the square

$= \left[\frac{a\sqrt{2}}{2}\right] = \left[\frac{a}{\sqrt{2}}\right]$ cm

$\Rightarrow$ Area of the circum-circle

$= \pi\left(\frac{a}{\sqrt{2}}\right)^2 = \left[\frac{\pi a^2}{2}\right]$ cm^2

$\therefore$ Area of in-circle : Area of circum-circle

$= \frac{\pi a^2}{4} : \frac{\pi a^2}{2} = 1 : 2$

24. (A) If a equilateral Δ is inscribed in a circle, it means the circle is circum-circle of that equilateral triangle.
Area of equilateral Δ

$= \frac{\sqrt{3}}{4} \times (\text{side})^2 = 4\sqrt{3}$ cm^2

$\text{side} = \frac{4\sqrt{3}}{\frac{\sqrt{3}}{4}}$ cm $= 4$ cm

Circum-radius of equilateral Δ

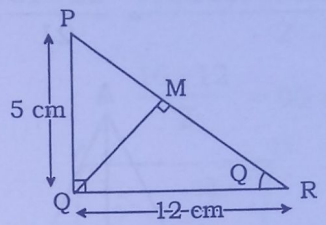
$= \frac{\text{side}}{\sqrt{3}} = \frac{4}{\sqrt{3}}$ cm

So, area of circle

$= \pi \times \left(\frac{4}{\sqrt{3}}\right)^2$ cm^2

$= \frac{16}{3}\pi$ cm^2

25. (B)



Let PQR be any right angled triangle, in which its base QR = 12 cm and the altitude PQ = 5 cm
Here we have to find out the perpendicular distance of its hypotenuse from the opposite vertex *i.e.* the length QM is to be found out.
Using Pythagoras theorem, we have;

$(PR)^2 = (PQ)^2 + (QR)^2$
$= 5^2 + 12^2$
$= 169 = 13^2$

$\Rightarrow$ PR = 13

Now area (PQR) $= \frac{1}{2} \times 12 \times 5$

$= 30$ cm^2

Also area (PQR) $= \frac{1}{2} \times PR \times QM$

$= \frac{1}{2} \times 13 \times QM$

$\Rightarrow$ $30 = \frac{13}{2}$ QM

$\therefore$ $QM = \frac{60}{13} = 4\frac{8}{13}$ cm

26.(B) AD = median $= \frac{\sqrt{3}}{2} \times 8$ cm

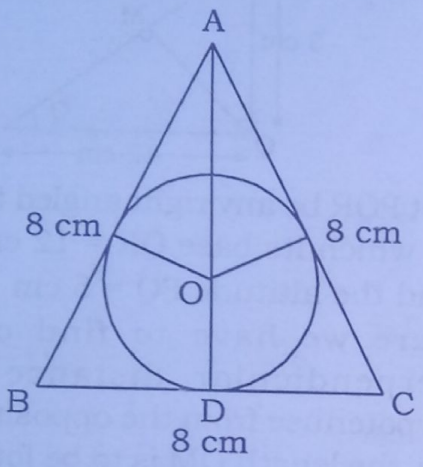
$= 4\sqrt{3}$ cm

OD = radius of the in-circle $= \frac{1}{3} 4\sqrt{3}$ cm

Area of in-circle

$= \frac{22}{7} \times \frac{4\sqrt{3}}{3} \times \frac{4\sqrt{3}}{3}$ cm^2

$= \frac{22 \times 16}{21}$ cm^2



Area of triangle $= \frac{\sqrt{3}}{4} \times 8 \times 8$ cm^2

$= 16\sqrt{3}$ cm^2

Required area of the portion between the triangle and the circle

$= \left(16\sqrt{3} - \frac{22 \times 16}{21}\right)$ cm^2

$= 16\left(\sqrt{3} - \frac{22}{21}\right)$ cm^2

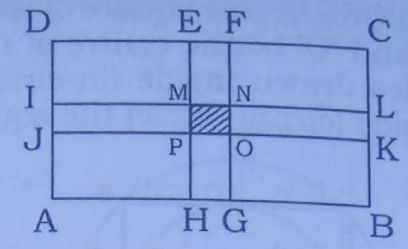
$= \frac{16}{21}(21 \times 1.732 - 22)$ cm^2

$= \frac{16}{21}(36.372 - 22)$ cm^2

$= \frac{16}{21}(14.372)$ cm^2

$= 10.95$ cm^2

27.(B)



Area of path

= Area of EFGH + Area of IJKL − Area of MNOP

$= 3 \times 80 + 3 \times 60 - 3 \times 3$

$= 240 + 180 - 9$

$= 411$ m^2

28.(C) Let the diagonals be $2x$ and $5x$

$\therefore$ Ratio in their areas

$= \frac{\frac{1}{2}(2x)^2}{\frac{1}{2}(5x)^2} = 4 : 25$

29. (A) Circumference of the wheel

$= 2 \times \frac{22}{7} \times 1.75$ m

$= 11$ m

$\therefore$ No. of revolution made in travelling

11 km $= \frac{11 \times 1000}{11}$

$= 1000$

30.(D) Let the length of the rectangle be x m.

$\therefore$ Its breadth $= x - 23$ m

$\therefore$ $2(x + x - 23) = 206$

$\Rightarrow$ $4x = 206 + 46 = 252$

$\Rightarrow$ $x = \frac{252}{4} = 63$ m

$\therefore$ Its area $= 63 \times (63 - 23)$

$= 2520$ m^2

31.(A) Perimeter of $\Delta = a + b + c$

$= 15 + 13 + 14$

$= 42$

$\therefore 2s = 42 \Rightarrow s = \frac{42}{2} = 21$ cm.

$\therefore$ Area of triangle

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{21(21-15)(21-13)(21-14)}$

$= 84$ cm^2

32.(C)By joining the mid-points of Δ ABC a triangle DEF is formed.

$$DE = \frac{12}{2} = 6 \text{ cm}$$

$$EF = \frac{18}{2} = 9 \text{ cm}$$

$$FD = \frac{26}{2} = 13 \text{ cm}$$

$$\therefore \text{Half-perimeter(s)} = \frac{6+9+13}{2}$$

$$= \frac{28}{2} = 14 \text{ cm}$$

$\therefore$ Area of ΔDEF

$$= \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{14(14-6)(14-9)(14-13)}$$

$$= \sqrt{14 \times 8 \times 5 \times 1}$$

$$= 4\sqrt{35} \text{ cm}^2$$

33.(A) Perimiter $= 2(l + b)$

$56 = 2(15 + b)$

$28 = 15 + b$

$= b = 28 - 15 = 13$ cm

$\therefore$ Area of Rectangle $= l \times b$

$= 15 \times 13$

$= 195 \text{ cm}^2$

34.(D) $\text{length}^2 + \text{breadth}^2 = \text{diagonal}^2$

$\therefore 400 + \text{breadth}^2 = 625$

$\therefore \text{breadth}^2 = 625 - 400$

$= 225 = 15^2$

$\Rightarrow$ breadth $= 15$ cm

$\therefore$ Area $= l \times b$

$= 20 \times 15 = 300 \text{ cm}^2$

35.(B)Let the length and breadth are $3x$ and $2x$

$\therefore 2(3x + 2x) = 100$

$\therefore 2 \times 5x = 100$

$\therefore x = \frac{100}{2 \times 5} = 10$

$\therefore$ length $= 3x = 3 \times 10 = 30$ m

36.(B)Square area $= \frac{\text{diagonal}^2}{2}$

$\text{diagonal}^2 = 2 \times$ square's area

$= 2 \times 256$

$\therefore$ diagonal $= 16\sqrt{2}$ m

37.(D)Ratio of perimeters

$= \sqrt{\text{ratio between areas}}$

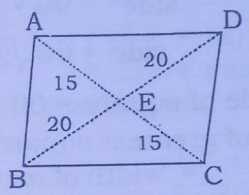
$= \sqrt{9:1} = 3:1$

38.(B)Area of rhombus

$= \frac{\text{Product of diagonals}}{2}$

$= \frac{16 \times 12}{2} = 96 \text{ cm}^2$

39.(A)



$AE = EC = \frac{30}{2} = 15$ cm

$BE = ED = \frac{40}{2} = 20$ cm

$\therefore$ in right angled ΔBEC,

$BC^2 = 20^2 + 15^2$

$\therefore BC^2 = 25^2$

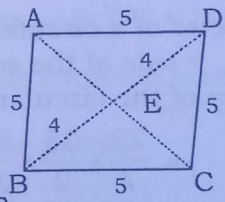
$\Rightarrow$ BC = 25 cm

$\therefore$ Perimeter of rhombus $= 4 \times$ side

$= 4 \times 25$

$= 100$ cm

40.(A)



In Δ BCE,

$BE^2 + EC^2 = BC^2$

$\therefore EC^2 = 25 - 16 = 9$

$\Rightarrow$ EC = 3 cm

$\therefore$ Diagonal AC $= 2 \times 3 = 6$ m

$\therefore$ Area of rhombus

$= \frac{\text{Product of diagonals}}{2}$

$= \frac{8 \times 6}{2} = 24 \text{ cm}^2$

41.(B) $\frac{6\sqrt{3}}{4}a^2 = 54\sqrt{3}$

$\Rightarrow \quad a^2 = 36 \Rightarrow a = 6$

Side of hexagon

42.(B) Side of one square tile

= H.C.F. of 10 m and 8 m

= 2 m

∴ Number of square tiles

$$= \frac{\text{area of floor}}{\text{area of one square tile}}$$

$$= \frac{10 \times 8}{2 \times 2} = 20$$

43.(B) Area of square = area of rectangle

∴ $\text{side}^2 = 90 \times 80 = 7200$

∴ $\text{side} = 60\sqrt{2}$ m

∴ Side of square = $60\sqrt{2}$ m

44.(B) Side of greatest square

= width of rectangular field

= 20 m

∴ Area of greatest square = 20^2

= 400 m^2

45.(A) Radius of the circle inscribed in the rectangle = $\frac{\text{breadth of rectangle}}{2}$

$$= \frac{14}{2} = 7 \text{ cm}$$

∴ Area of circle inscribed = πr^2

$$= \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

46.(B) Diameter of a circular bed

= side of the square = 35 m

∴ Area of the circular bed

$$= \frac{22}{7} \times \frac{35}{2} \times \frac{5}{2} = 962.5 \text{ m}^2$$

47.(C) Circular wire is bent into shape of square

∴ Perimeter of square

= circumference of circle

∴ Side of square × 4 = $2 \times \frac{22}{7} \times 56$

$= 2 \times 22 \times 8$

∴ Side of square = $\frac{2 \times 22 \times 8}{4}$ = 88 cm

48.(A) Area of a square field = 121

∴ Square's side = 11 m

∵ Perimeter of circular field = perimeter of square

∴ $2 \times \frac{22}{7} \times r = 11 \times 4$

$\Rightarrow \quad r = 7$ m

∴ Radius of circle = 7 m

49.(D) Let the length and breadth of a square is 100 metre

l = 100m, b = 100 m, Area = 10,000m^2

Now A.T.Q.,

l = 100 m – 20 m = 80 m

$b = x$

Area = $80 \times x = 10{,}000$ m^2

$$x = \frac{10000}{80} = 125 \text{ m}$$

∴ New breadth is 125 m.

∴ 125 – 100 = 25% increased.

or

Percentage increase in breadth

$$= 100\left(\frac{R}{100 - R}\right) = \frac{100 \times 20}{100 - 20} = 25\%$$

{R = % decrease in length}

50.(A) % increase in area = $10 + 5 + \frac{10 \times 5}{100}$

$= 10 + 5 + 0.5$

= 15.5%

51.(D) Percentage decrease in area

$$= -20 - 15 + \frac{-20 \times -15}{100}$$

= – 32% increase

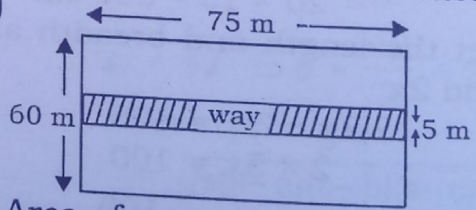
or 32% decrease

52.(B) Percentage change in the area

$$= 18 - 12 + \frac{10 \times -12}{100}$$

= 4.8 % increase

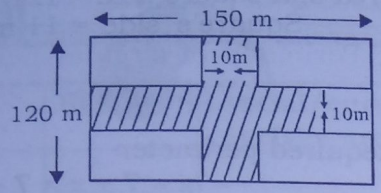
53.(C)



Area of way = length of garden × width of way

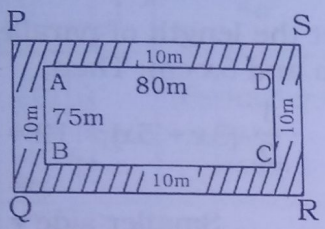
= 75 × 5 = 375 m^2

54.(A)



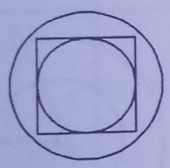
Area of two path = $10 \times (150 \times 120 - 10)$
$= 10 \times 260$
$= 2600\ m^2$

55.(B)



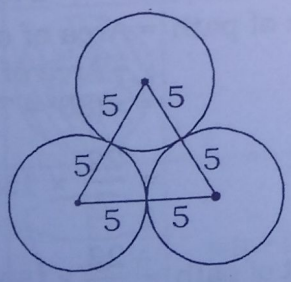
Length of PQRS = 80 + (10 + 10)
= 80 + 20 = 100m
Width of PQRS = 75 + (10 + 10)
= 75 + 20 = 95m
∴ Area of sitting place
= area of PQRS – area of ABCD
= 100 × 95 – 80 × 75
= 9500 – 6000 = 3500m²

56.(A)



Area of circum-circle of square
= 2 × area of in-circle of square
$= 2 \times \pi \times (2\sqrt{7})^2$
$= 2 \times \frac{22}{7} \times 4 \times 7$
$= 176\ cm^2$

57.(B)



$\Rightarrow \frac{\sqrt{3}}{4} \times 100 - \frac{22}{7} \times 25 \times \frac{180}{360}$

$\left(\sqrt{3} - \frac{22}{7} \times \frac{1}{2}\right) \times 25$

$(1.732 - 1.571) \times 25$
$(0.161) \times 25 = 4.026$

58.(A) If side of square is 'a', then of smallest circle = $(\sqrt{2} - 1)a$
∴ Area of smallest circle = πr^2

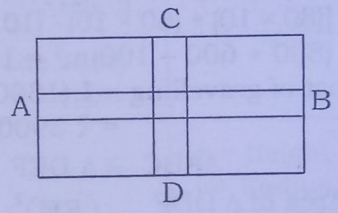
$= \frac{22}{7} \times \left[\frac{(\sqrt{2} - 1)a}{2}\right]^2$

$= \frac{22}{7} \times \left[\frac{(1.4 - 1) \times 24}{2}\right]^2$

$= (0.4 \times 12)^2$
$= 23.04\ \pi\ cm^3$

59.(A) Length of the diagonal
$= \sqrt{12^2 + 5^2}$ meters
$= \sqrt{169} = 13$ meters

60.(D)



Area of the path AB = $19\frac{1}{4} \times 2$ sq m

Area of the path CD = $12\frac{1}{4} \times 2$ sq m

Area of the common portion
$= 2 \times 2$ sq m

Area of the paved

$= \left(19\frac{1}{4} + 2 + 12\frac{1}{2} \times 2 - 2 \times 2\right)$ sq m

$= \left(19\frac{1}{4} + 12\frac{1}{2} - 2\right) \times 2$ sq m

$= \frac{119}{4}$ sq m

∴ Cost = ₹ $\frac{119}{4} \times 12.32$ = ₹ 733.04