Aptitude-Area-Problems

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>
> https://rtpnotes.vercel.app

> ≔ **Reference Playlist**
>
> https://youtube.com/playlist?list=PL8p2I9GklV454LdGfDOw0KkNazKuA-6B2&feature=shared

- Aptitude-Area-Problems
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Formula

- Length of arc

$$\frac{\theta}{36} \times 2\pi r$$

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Question 1

If each side of a square is increased by 150% find the increase percent in its area

- Let length of side = A
- Area of a square = A^2
- A + 150/100A
- A + (3/2) A
- (5/2)A => 25/4 A^2 = Area
- Increase in percentage = 25A^2/4 - A^2 = 21A^2/4
- **=> (21A^2/4 / A^2) x 100 = 525%**

Question 2

An arc of length 22cm of a circle subtends an angle of 72 at the centre. What is the radius of the circle?
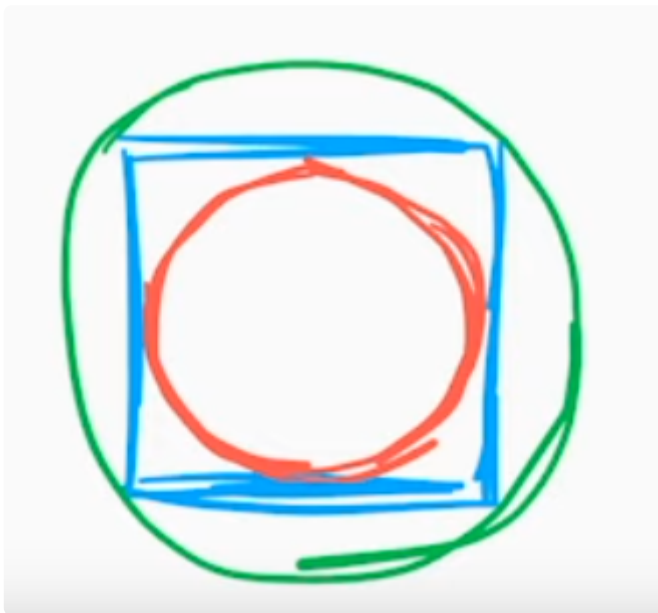
$$\frac{72}{36} \times 2\pi r = 22$$
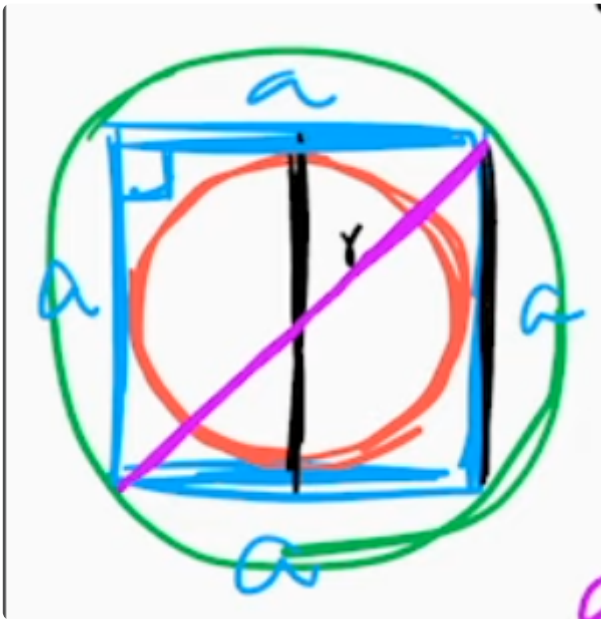
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$$r = \frac{35}{2} \approx 17.5$$

Question 3

What is the ratio between the areas of two circles which have respectivelt been inscribed in a square and circumscribed about the same square

- Let side of Square be a
- Let radius of smaller and bigger circle be r and R respectively
- 2r = a => r = a/2
- 2R = diagonal of square

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- Finding R using pythagoras

  $$R = \frac{a\sqrt{2}}{2}$$

- Ratio of small and larger cricle

  $$\frac{\pi \left(\frac{a}{2}\right)^2}{\pi \left(\frac{a\sqrt{2}}{2}\right)^2}$$

- **Ratio : 1/2**

Question 4

There is a town called Metron where the front and rear wheels of vehicles are of different sizes, the measurement unit followed in the town in meter. The circumference of the front wheel of the car is 133m and that of rear wheel is 190m. So what is the distance travelled by the car in meters when the front wheel has done 9 more revolution around the rear

- Let say Rear Wheels revolved for n times
- Front Wheel Revolved = n + 9 time
- Real Wheel covered distance = 190n
- Front Wheel Covered Distance = 133(n + 9)
- 190n = 133(n + 9)
- => 57n = 133* 9
- => n = 21
- Distance Travelled = 190 * 21 = **3990 m**

Question 5

In the given figure, find the ratio of area of the square to area of the triangle. (Hint: Its an isoceles triangle)

- Let side of square be a, and the base and height of the triangle be a
- a^2 / (1/2) a^2 => 2/1
- 2:1

Question 6

The base of a parallelogram is twice its height and its area is 128 sq. cm. Find the base and the height.

- Given
    - Area = 128 sq cm
    - Base = 2 x Height
    - Assume the parallelogram is a rectangle
        - l x b = 128
        - l x 2l = 128
        - 2l^2 = 128
        - l^2 = 64
    - l = 8
    - Base = L x 2 = 16

Question 7

A wheel makes 2000 revolutions in covering a distance of 11 km. Find the radius of the wheel.

- n = 2000
- Distance = 11km
- Circumference x n = 11km = 11,000m
- 2 x pi x r x 2000 = 11,000
- pi x r = 11/4
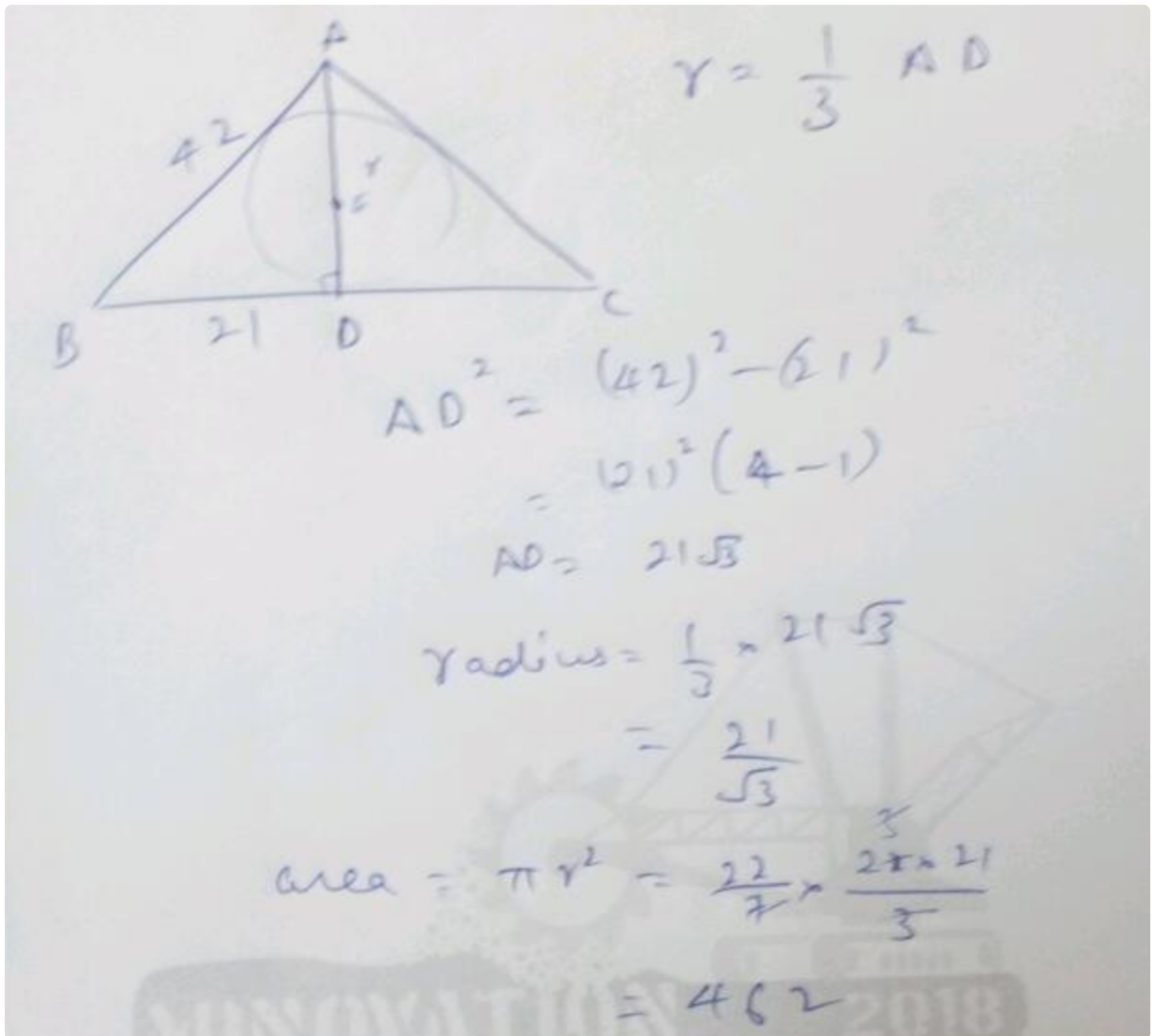- r = 11/4x3.14
- r = 87.5

Question 8

The length and breadth of an auditorium are in the ratio 3 : 2. If the area of the ceiling is 600 sq. m and the area of four walls is 1500 sq. m, then the height of the auditorium is?

- Given
    - L:B = 3:2
    - Area of ceiling = 600 sq m
    - Area of 4 walls = 1500 sq m
    - Height = ?
- Finding length and breadth
    - 3x x 2x = 600
    - if x = 10
    - 30x20 = 600
    - Length = 30m, breadth = 20m
- 2x(30xheight) + 2x(20xheight) = 1500
- 60xheight + 40xheight = 1500
- 100 x height = 1500
- Height = 15m

Question 9

Each side of an equilateral triangle is 42 cm. What is the area of the circle inscribed in it?

$$r = \frac{1}{3} AD$$

$$AD^2 = (42)^2 - (21)^2$$

$$= (21)^2 (4 - 1)$$

$$AD = 21\sqrt{3}$$

$$radius = \frac{1}{3} \times 21\sqrt{3}$$

$$= \frac{21}{\sqrt{3}}$$

$$area = \pi r^2 = \frac{22}{7} \times \frac{2 \times 21}{\sqrt{3}}$$

$$= 462$$

Question 10

The perimeter of an equilateral triangle is equal to a regular hexagon. Find out the ratio of their areas?

Concept Used-

Area of equilateral triangle = √3/4 × Side^2

Area of a regular hexagon = 3√3/2 × Side^2

Calculation-

Let the perimeter of the triangle and hexagon be 6a

Each Side of Hexagon = a

Each Side of Triangle = 2a

Area of Hexagon = 3√3/2 × a^2

Area of Triangle = √3/4 × (2a)^2

⇒ √3a^2

∴ The ratio of their areas = (3√3/2 × a^2) : (√3a^2)

⇒ 3 : 2

∴ **The required ratio will be 3 : 2.**