



SSC FOUNDATION



सम्यान 1.0 बैच

MATHS

MENSURATION-2D

CIRCLE/वृत्त

CONCEPT FORMULAS & TRICKS



LIVE 11:00 AM-RY SHASHI SIR

WELCOME TO



Preparing Bharat, Empowering Futures

airGurukul Institute for Career Growth

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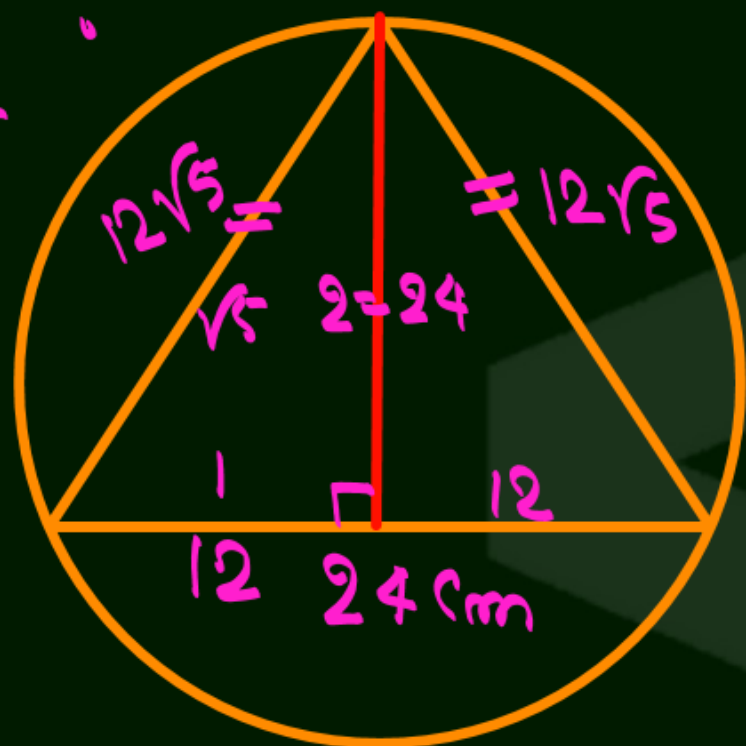
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Q. ABC किसी वृत्त में अंकित समद्विबाहु त्रिकोण है, यदि $AB = AC = 12\sqrt{5}$ तथा $BC = 24$ cm है, तो वृत्त की त्रिज्या क्या होगी?

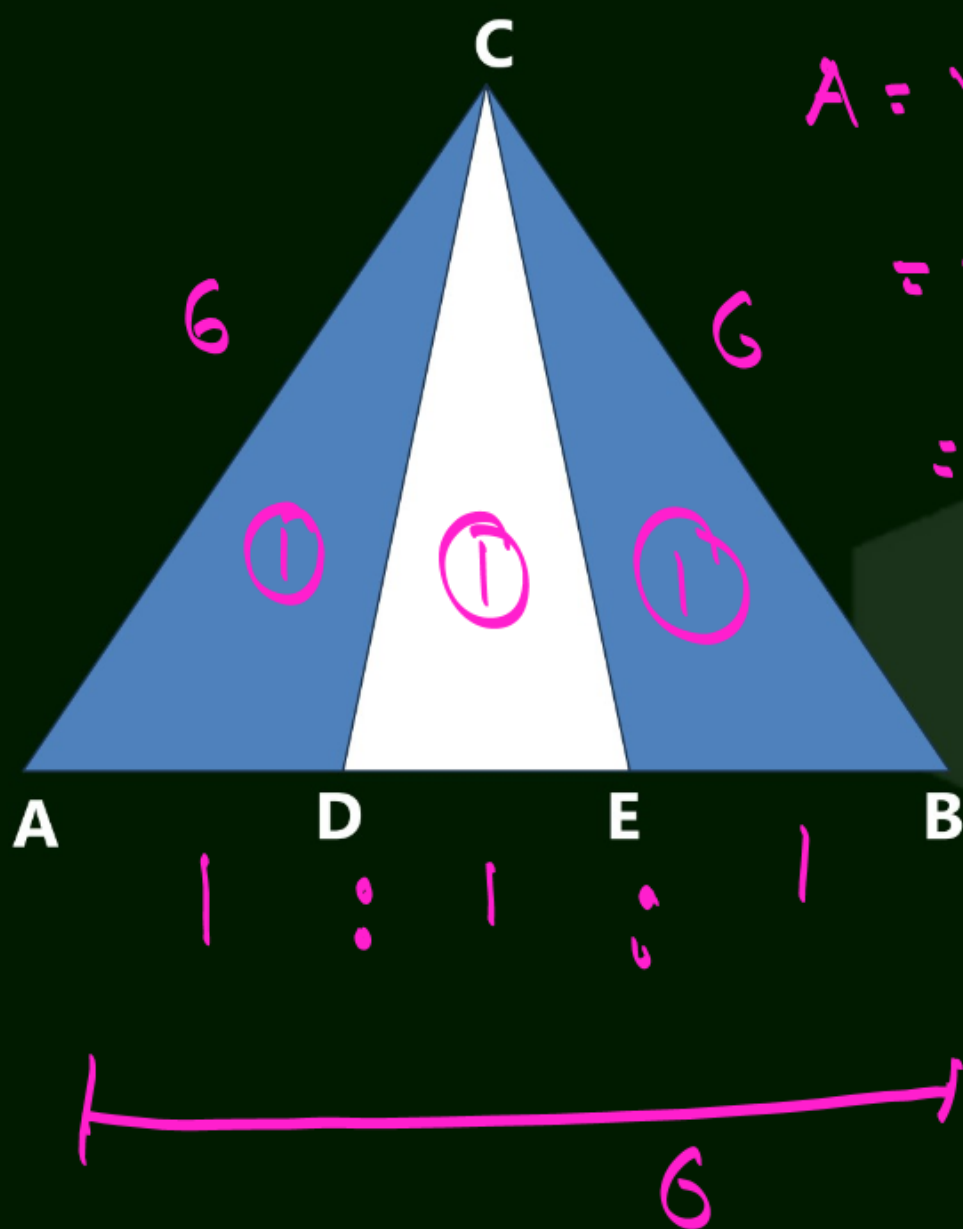
ABC is an isosceles triangle inscribed in a circle. If $AB = AC = 12\sqrt{5}$ and $BC = 24$ cm, what is the radius of the circle?

- a) 10 cm
- ✓ b) 15 cm
- c) 12 cm
- d) 14 cm

$$R = \frac{abc}{4\Delta} = \frac{12\sqrt{5} \times 12\sqrt{5} \times 24}{4 \times \frac{1}{2} \times 24 \times 24} = 3 \times 5 = 15 \text{ cm}$$



$$\begin{aligned} 12\sqrt{5} : 12 : 24 \\ \sqrt{5} : 1 : 2 \\ \sqrt{(12)^2 - 12^2} = 12 \end{aligned}$$



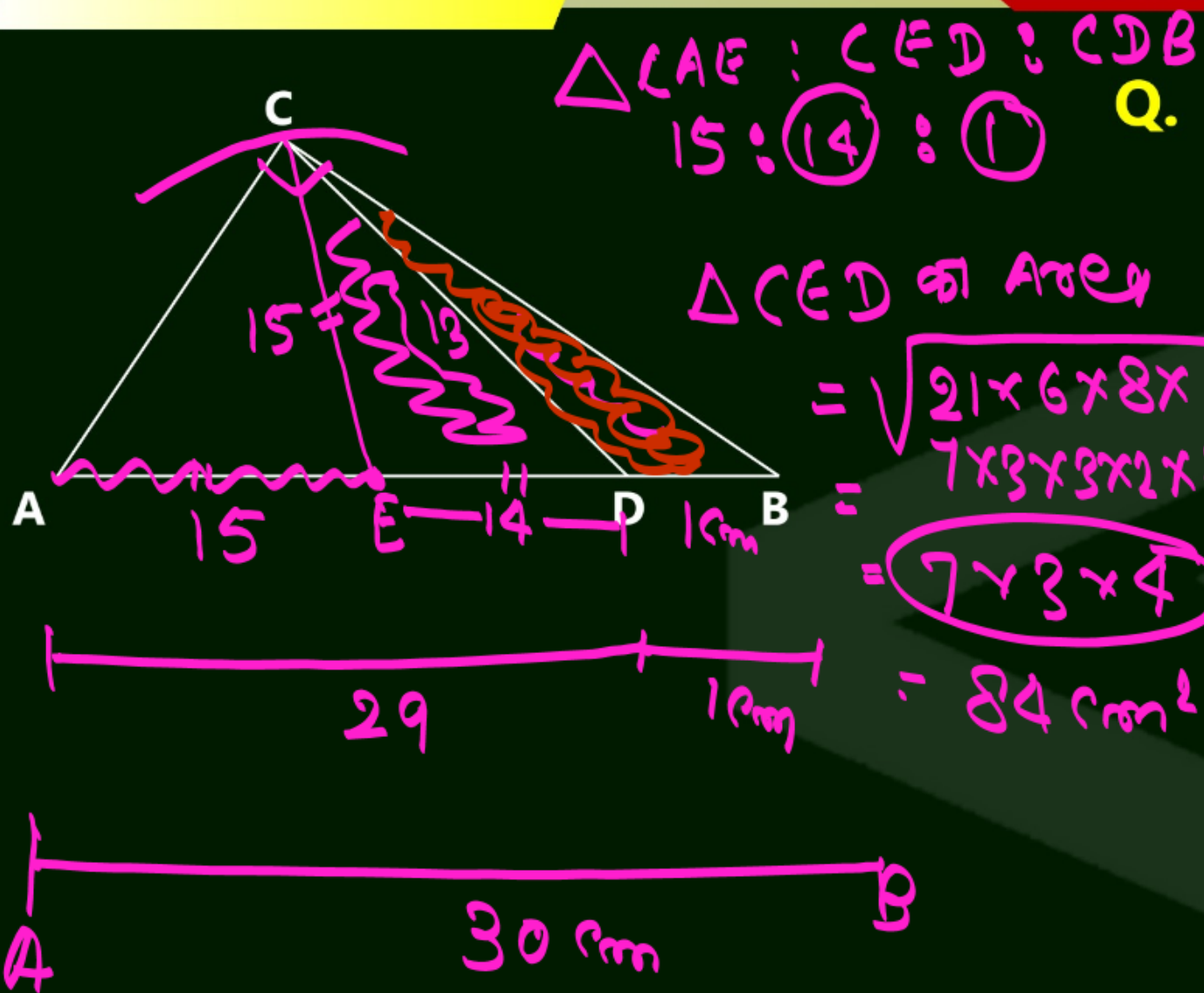
$$\begin{aligned}
 A &= \frac{\sqrt{3}}{4} \times 6^2 \\
 &= \frac{\sqrt{3}}{4} \times 36 \\
 &= \sqrt{3} \times 9 \\
 &= 9\sqrt{3}
 \end{aligned}$$

Q. समबाहु त्रिभुज ABC, $AD = DE = BE$ है और D और E रेखा AB पर है। $AB = 6\text{cm}$ है, तो छायांकित भाग का क्षेत्रफल क्या है?

In equilateral triangle ABC, $AD = DE = BE$ and D and E are on the line AB. If $AB = 6\text{cm}$, then what is the area of the shaded region?

- (a) 9 cm^2
- (b) $6\sqrt{3}\text{ cm}^2$
- (c) $5\sqrt{3}\text{ cm}^2$
- (d) इनमें से कोई नहीं

$$\begin{aligned}
 3 \text{ unit} &= 9\sqrt{3} \\
 2 \text{ unit} &= \frac{9\sqrt{3}}{2} \times 2 = 9\sqrt{3}
 \end{aligned}$$



Q. $\triangle ABC$ में वृत्त C पर समकोण है। यदि $AD = 29 \text{ cm}$, $BD = 1 \text{ cm}$ और $CD = 13 \text{ cm}$ है, तो $\triangle ABC$ का क्षेत्रफल बताइए।

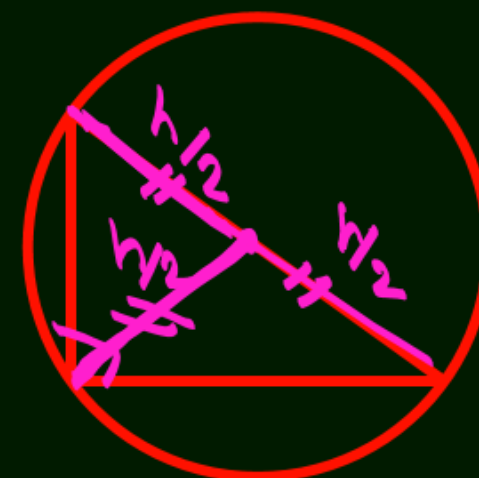
$\triangle ABC$ is at right angle at circle C. If $AD = 29 \text{ cm}$, $BD = 1 \text{ cm}$ and $CD = 13 \text{ cm}$, then find the area of $\triangle ABC$.

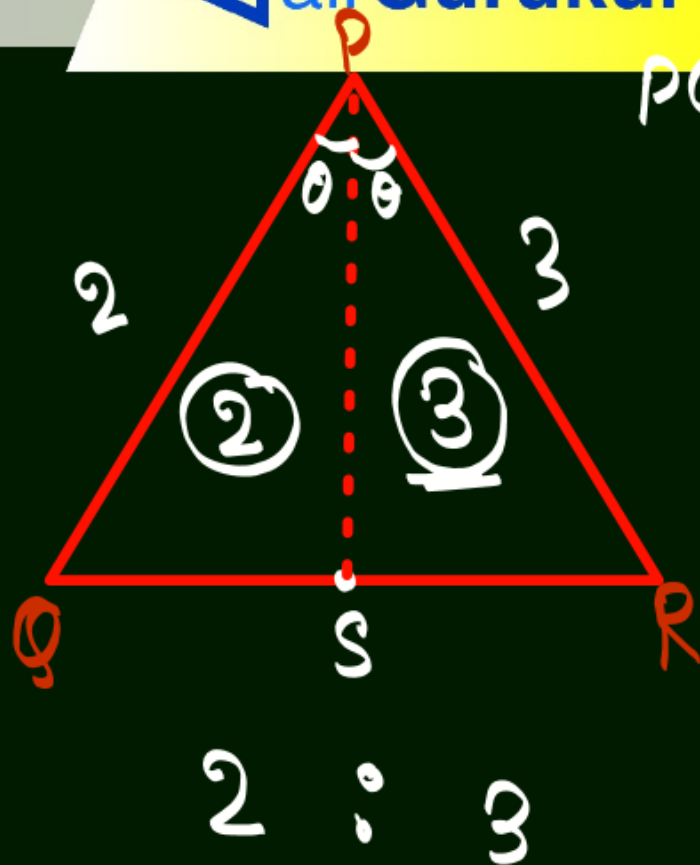
- a) 4 cm^2
- b) 6 cm^2
- c) 8 cm^2
- d) 10 cm^2

$$S = \frac{15 + 13 + 14}{2}$$

$$= \frac{42}{2} = 21$$

$$\triangle BCD = \frac{84 \times 1}{14} = 6 \text{ cm}^2$$





$$PQR = 180 \text{ cm}^2$$

$$\Delta PSR = 180 \times \frac{3}{5} = 108 \text{ cm}^2$$

Q. PQR एक त्रिभुज है, जिसका क्षेत्रफल 180 cm^2 है। S, भुजा QR पर एक बिंदु इस प्रकार है कि PS, $\angle QPR$ पर कोण द्विविभाजक है। यदि $PQ: PR = 2:3$ है, तो त्रिभुज PSR का क्षेत्रफल (cm^2 में) क्या है?

PQR is a triangle whose area is 180 cm^2 . S is a point on side QR such that PS is the angle bisector of $\angle QPR$. If $PQ: PR = 2:3$, then what is the area (in cm^2) of triangle PSR?

- a) 90
- ✓ b) 108
- c) 144
- d) 72



$$\frac{1}{2} \times 6k \times 2 = \frac{1}{2} \times \sqrt{455} \times 4$$

$$k = \frac{24}{\sqrt{455}}$$

$$P = 13k$$

$$= 1.3 \times 24$$

$$= \frac{312}{\sqrt{455}}$$

Side - :

$$\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$$

$$6 : 4 : 3$$

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

$$S = \frac{6k + 4k + 3k}{2}$$

$$= \frac{13k}{2}$$

$$A = \sqrt{\frac{13k}{2} \times \left(\frac{13k}{2} - 6k\right) \times \left(\frac{13k}{2} - 4k\right) \times \left(\frac{13k}{2} - 3k\right)}$$

$$= \sqrt{\frac{13k}{2} \times \frac{k}{2} \times \frac{5k}{2} \times \frac{7k}{2}} = \frac{k}{4} \sqrt{455}$$

Q. किसी त्रिभुज की ऊचाई क्रमशः 2cm, 3cm और 4cm है। त्रिभुज का परिमाण ज्ञात करें?

The heights of a triangle are 2cm, 3cm and 4cm respectively. Find the perimeter of a triangle?

- a) $\frac{624}{\sqrt{725}}$ cm
- b) $\frac{246}{\sqrt{468}}$ cm
- c) $\frac{312}{\sqrt{455}}$ cm
- d) $\frac{432}{\sqrt{455}}$ cm

$$a : b : c$$

$$\frac{1}{h_1} : \frac{1}{h_2} : \frac{1}{h_3}$$

इसे जरूर solve करना है

H.W

Q.

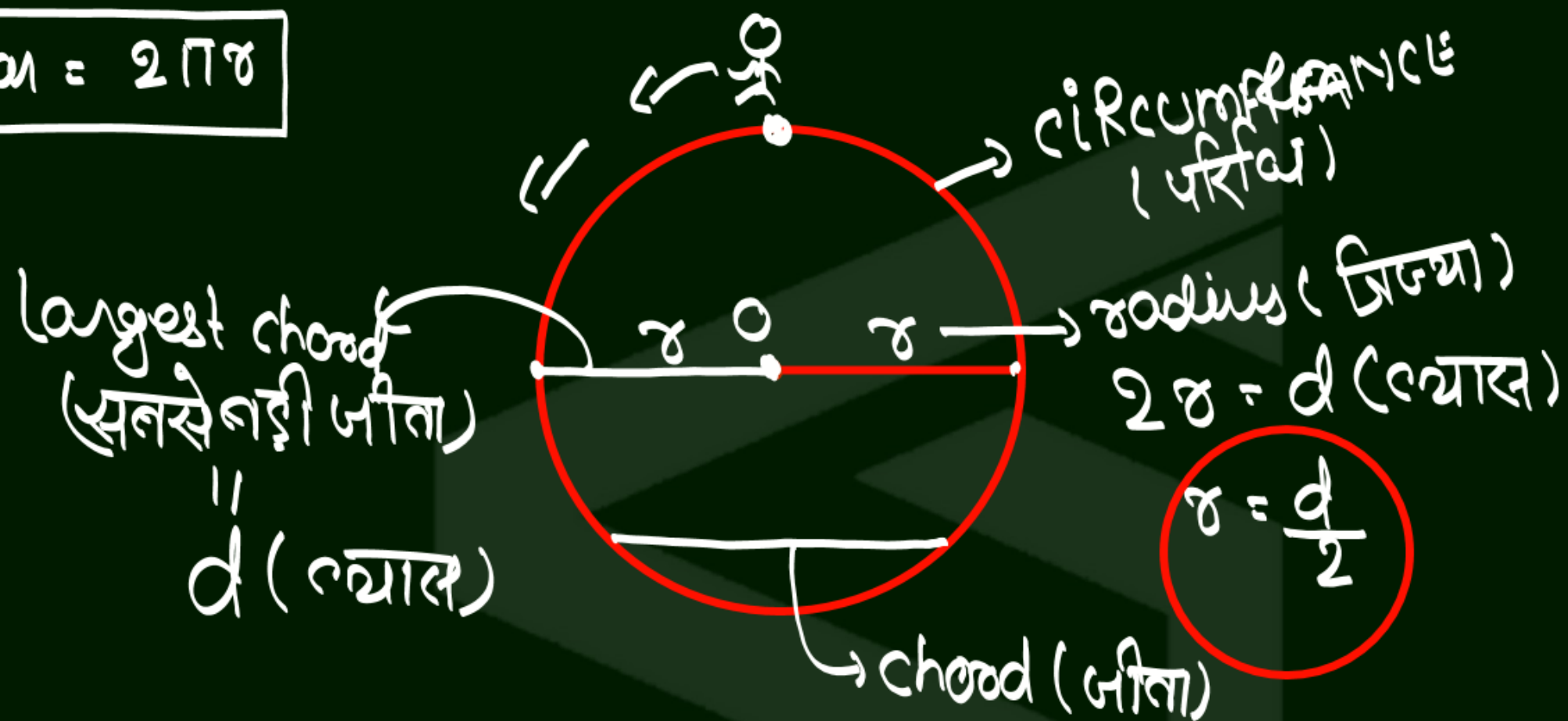
$\triangle ABC$ में, D और E क्रमशः AB और BC पर दो बिंदु हैं जैसे $AD : DB = 2 : 3$ और $DE \parallel AC$ है। यदि $\triangle ADE$ का क्षेत्रफल 18 cm^2 है, तो $\triangle ABC$ का क्षेत्रफल क्या है?

In $\triangle ABC$, D and E are two points on AB and BC respectively, such that $AD : DB = 2 : 3$ and $DE \parallel AC$. If the area of $\triangle ADE$ is 18 cm^2 , what is the area of $\triangle ABC$?

- a) 30
- b) 75
- c) 54
- d) 45

CIRCLE (वृत्त)

$$1 \text{ chakra} = 2\pi r$$



$$A = \pi r^2$$

$$P = 2\pi r$$

$$d = 2r$$

$$r = \frac{d}{2}$$

$$\text{Largest chord} = d$$

Fast track -:



$$P = 2\pi r$$

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

$$r = 14$$

$$P = \frac{2 \times 22 \times 7 \times 2}{7}$$

$$44$$

$r = 7k$	$P = 44k$	$A = 154k^2$
$r = 14$	44×2	154×2^2 <u>616</u>
$r = 21$	$44 \times 3 = 132$	154×9 1386
$r = 28$	$44 \times 4 = 176$	154×16 2464
$r = 35$	$44 \times 5 = 220$	154×25 3850

$$A = \frac{22}{7} \times 7 \times 7 = 154$$

$$r = 14$$

$$A = \frac{22}{7} \times (7 \times 2) \times (7 \times 2)$$

$$= \frac{22}{7} \times 7 \times 7 \times 2^2$$



$$P = 88 \text{ cm} / 44 = k = 2$$

$$r = 7k = 7 \times 2 = 14$$

$$A = 154 \times 2^2 = 616$$

$$r = \frac{1.75}{4} = 0.25$$

$$P = 44 \times 0.25 = 11.00 \text{ cm} \\ = 11 \text{ cm}$$

Q. The radius of a circle is 1.75 cm. What is the circumference of the circle?

एक वृत्त की त्रिज्या 1.75 सेमी है। वृत्त की परिधि क्या है? (Take $\pi = 22/7$)

- (a) 22 cm
- (b) 9.63 cm
- ☒ (c) 11 cm
- (d) 5.5 cm

$$P = 2 \times \frac{22}{7} \times 1.75 \\ = 11 \text{ cm}$$

$$\pi r^2 = 1386$$

$$\frac{22}{7} \times r^2 = 1386$$

$$r^2 = \frac{1386 \times 7}{22} = 9 \times 7 \times 7$$

$$r = \sqrt{9 \times 7^2} = 3 \times 7 = 21 \text{ cm}$$

Q. The area of a circle is $1,386 \text{ cm}^2$. What will be the radius of the circle? ($n = 22/7$)

एक वृत्त का क्षेत्रफल $1,386 \text{ cm}^2$ है। वृत्त की त्रिज्या क्या होगी? ($n=22/7$)

(a) 14 cm

(b) 21 cm

(c) 7 cm

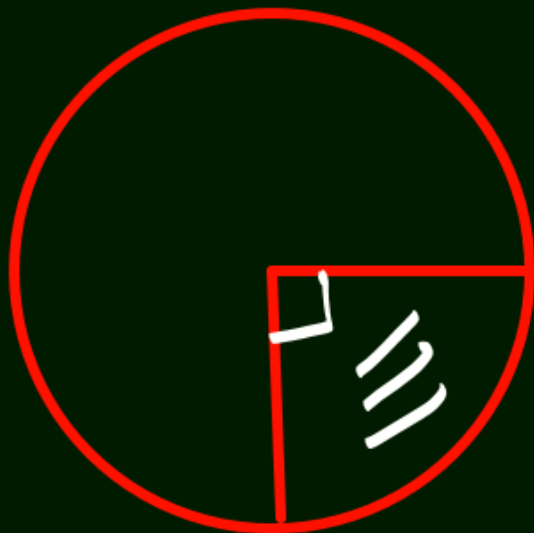
(d) 18 cm

$$A \xrightarrow{154k^2}$$

$$r = 7k = 7 \times 3 = 21$$

$$\frac{1386}{154} \rightarrow k^2 = 9$$

$$k = 3$$



$$\text{Area} = \pi r^2 \times \frac{90^\circ}{360^\circ}$$

$$\pi r^2 \times \frac{1}{4} = \frac{\pi}{9}$$

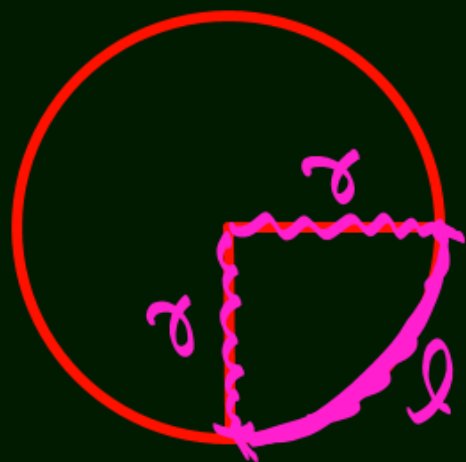
$$r^2 = \frac{1}{9}$$

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

Q. The area of a quadrant of a circle is 15 m^2 . It's radius (in meters) is equal to.

किसी वृत्त के चतुर्थांश का क्षेत्रफल $\frac{\pi}{9} \text{ m}^2$ है। इसकी त्रिज्या का मान (मी. में) ज्ञात करें।

- (a) $\frac{3}{2}$
- (b) $\frac{1}{3}$
- (c) $\frac{1}{2}$
- ☒ (d) $\frac{2}{3}$



$$l = 2\pi r \times \frac{\theta}{360^\circ}$$

$$= 2\pi r \times \frac{1}{4} = \frac{\pi r}{2}$$

$$2r + \frac{\pi r}{2} = 75$$

$$r(2 + \frac{22}{14}) = 75$$

$$r(\frac{50}{14}) = 75$$

$$r = \frac{75 \times 14}{50} = 21 \text{ cm}$$

$$A = \pi r^2 \times \frac{1}{4} = \frac{22}{7} \times 21^2 \times \frac{1}{4} = \frac{693}{2} = 346.5$$

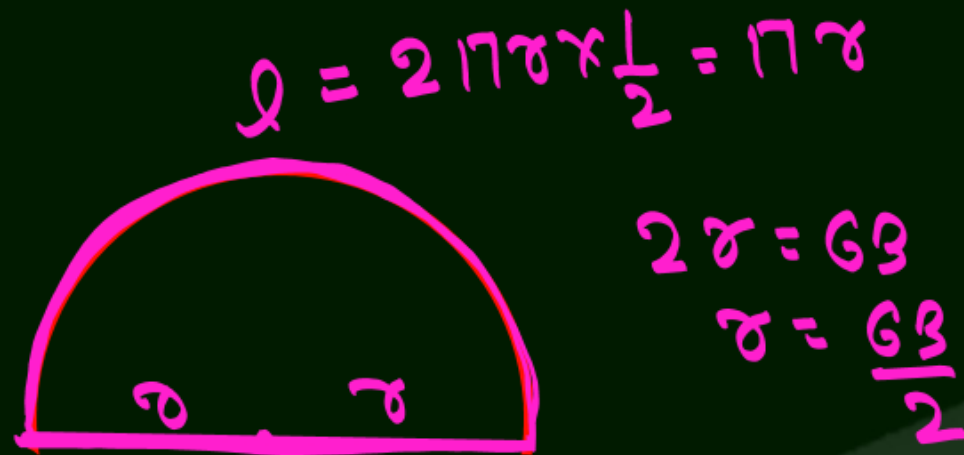
Q. The perimeter of a sheet of paper in the shape of a quadrant of a circle is 75 cm. Its area would be :/ वृत्त के चतुर्थांश के आकार में एक कागज की शीट का परिमाप 75 से.मी. है, तो उसका क्षेत्रफल ज्ञात करें। ($\pi = 22/7$)

(a) 512.25 cm²

✓ (b) 346.5 cm²

(c) 100 cm²

(d) 693 cm²



$$\begin{aligned}
 P &= \pi r + 2r \\
 &= r \left(\frac{22}{7} + 2 \right) \\
 &= r \left(\frac{36}{7} \right) = \frac{18}{7} \times \frac{63}{2} = 162 \text{ cm}
 \end{aligned}$$

Q. A semicircular shaped window has diameter of 63 cm, its perimeter equals

एक अर्द्धवृत्त का व्यास 63 सेमी. हैं। परिमाप ज्ञात करें?

($\pi = 22/7$)

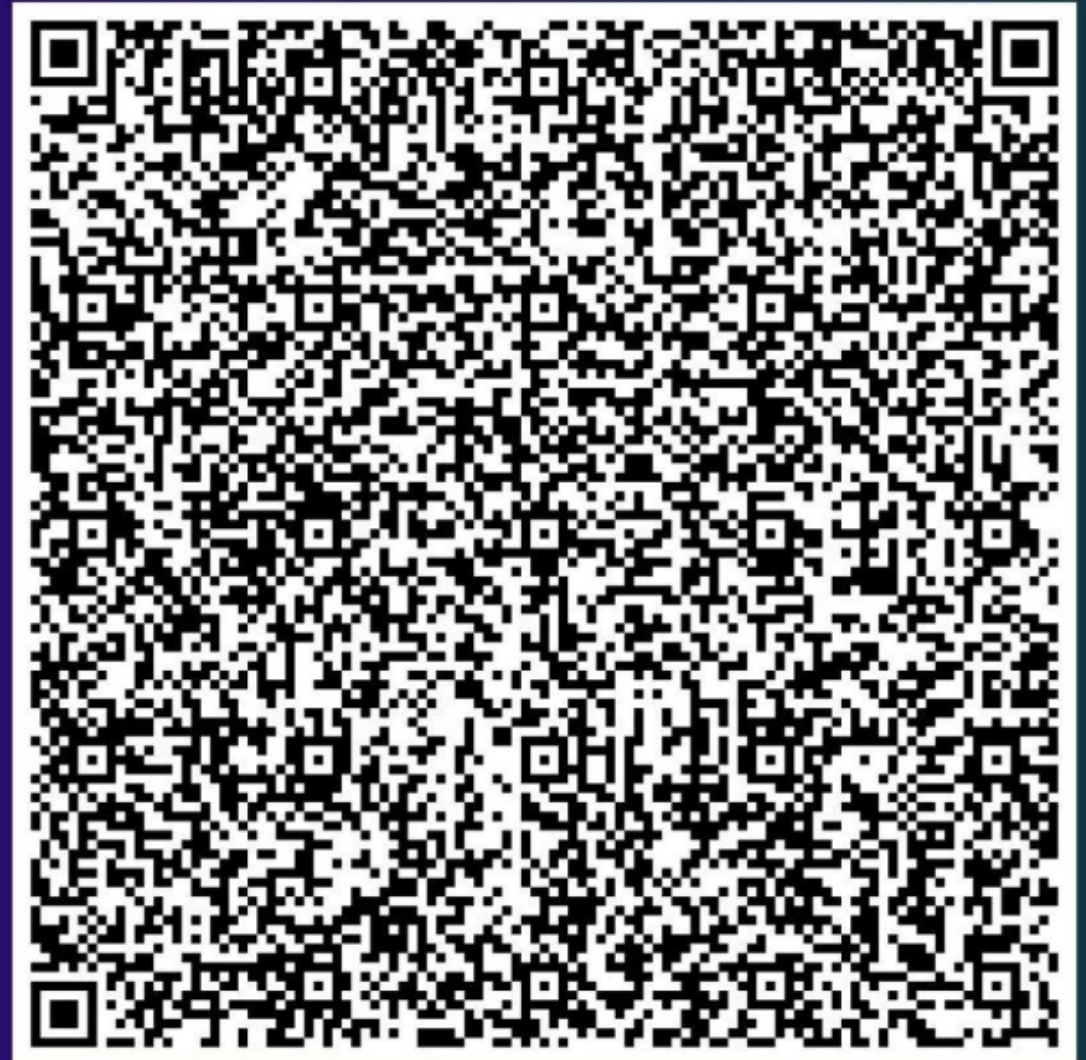
(a) 126 cm

✓ (b) 162 cm

(c) 198 cm

(d) 261 cm

MATHS BY SHASHI SINGH RATHORE



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