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Class 9th, Mathematics Date: 9.12.2024

REVISION TEST (Ch 17 & 18)

Ques.1: Find the area of a triangle whose sides are 34cm, 20cm and 42cm. Hence, find the length of the altitude corresponding to the shortest side.

Ques.2: Find the area of an equilateral triangle whose side is 8m. Give your answer correct to two decimal places.

Ques.3:- If the lengths of the sides of a triangle are in the ratio 3:4:5 and its perimeter is 48cm, find its area.

Ques.4:- Find the area of an isosceles triangle whose base is 6cm and perimeter is 16cm.

Ques.5:- If the area of a semi-circular region is 77cm², find its perimeter.

Ques.6:- The wheel of a cart is making 5 revolutions per second. If the diameter of the wheel is 84cm, find its speed in km/h. Give your answer, correct to the nearest km.

Ques.7:- The circumference of a circle is 123.2cm. Calculate:-

(i) the radius of the circle in cm.

(ii) the area of the circle in cm², correct to the nearest cm²

Ques.8:- The sum of diameters of two circles is 14cm and the difference of their circumferences is 8cm. Find the circumference of the two circles.

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Solution of Revision Test-3

Sol.1 :- Consider 34cm, 20cm and 42cm as the sides of triangle. Let $a = 34cm$, $b = 20cm$ and $c = 42cm$

s = semi perimeter $= \frac{a+b+c}{2} = \frac{34+20+42}{2}$

$= \frac{96}{2} = 48cm$

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

$= \sqrt{48(48-34)(48-20)(48-42)}$

$= \sqrt{8 \times 6 \times 14 \times 14 \times 2 \times 6}$

$= 14 \times 6\sqrt{8 \times 2}$

$= 14 \times 6 \times 4 = 336\ cm^2$

Here, the shortest side of the triangle is 20cm

Area of triangle $= \frac{1}{2} \times$ base $\times$ height

$336 = \frac{1}{2} \times 20 \times h$

$\Rightarrow h = \frac{336 \times 2}{20} = 33.6\ cm$

Sol.2 :- side of equilateral triangle $= 8m$

Area of equilateral triangle $= \frac{\sqrt{3}}{4}(side)^2$

$= \frac{\sqrt{3}}{4} \times 8 \times 8$

$= \sqrt{3} \times 16 = 16\sqrt{3}$

$= 16 \times 1.732 = 27.71\ m^2$

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Sol 3:- Let the sides are $3x$, $4x$ and $5x$

Given perimeter $= 48\text{cm}$

Semi-perimeter $= \frac{3x+4x+5x}{2} = \frac{48}{2} = 24\text{ cm}$

$\Rightarrow \frac{12x}{2} = \frac{48}{2} \quad \Rightarrow x = 4\text{ cm}$

Here, $s = 24$, $a = 12$, $b = 16$, $c = 20\text{ cm}$

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

$= \sqrt{24(24-12)(24-16)(24-20)}$

$= \sqrt{24 \times 12 \times 8 \times 4}$

$= 12 \times 4 \times 2 = 96\text{ cm}^2$

Sol 4:- Base of triangle $= 6\text{cm}$, Perimeter $= 16\text{cm}$

Let the other two equal sides are x cm each

Then, perimeter of triangle $= x + x + 6 = 16\text{ cm}$

$\Rightarrow 2x = 10\text{ cm} \quad \Rightarrow x = 5\text{ cm}$ each.

So, the sides of triangle are 5cm, 5cm and 6cm

By using Heron's Formula,

Area of triangle $= 12\text{ cm}^2$

Sol 5:- Area of a semicircular region $= 77\text{ cm}^2$

Consider r as the radius of the region

Area $= \frac{1}{2}\pi r^2 \quad \Rightarrow \frac{1}{2} \times \frac{22}{7} \times r^2 = 77$

$\Rightarrow r^2 = \frac{77 \times 2 \times 7}{22} = 49 = 7^2$

$\Rightarrow r = 7\text{cm}$ Perimeter of the region

$= \pi r + 2r$

$= \frac{22}{7} \times 7 + 2 \times 7 \quad = 22 + 14 = 36\text{cm}$

Sol.6:- Diameter of wheel $= 84\text{cm}$

Radius of wheel $= \frac{84}{2} = 42\text{ cm}$

Here, Circumference of wheel $= 2\pi r$

$= 2 \times \frac{22}{7} \times 42 \quad = 264\text{cm}$

So, the distance covered in 5 reductions

$= 264 \times 5 = 1320\text{ cm}$

Time $= 1$ second

Speed of wheel $= \frac{1320 \times 60 \times 60}{1 \times 100 \times 1000}$

$= 47.25\text{ km/hr}$

$= 48\text{ km/hr.}$

Sol.7:- Circumference of circle $= 123.2\text{ cm}$

$\Rightarrow 2\pi r = 123.2 \quad \Rightarrow 2 \times \frac{22}{7} \times r = 123.2\text{ cm}$

$\Rightarrow r = 123.2 \times \frac{7}{2 \times 22} \Rightarrow 19.6\text{ cm}$

(ii) Here, Area of the circle $= \pi r^2$

Substituting the values $= \frac{22}{7} \times 19.6 \times 19.6$

$= 1207.36$

$\approx 1207\text{ cm}^2$

Sol.8:- Hint:- $2R + 2r = 14 \Rightarrow R + r = 7 \quad \text{---(i)}$

$2\pi R - 2\pi r = 8 \Rightarrow \pi(R - r) = 4 \quad \text{---(ii)}$

So, $R = \frac{91}{22}$ and $r = \frac{63}{22} \Rightarrow 2\pi R = 18\text{cm}$

and $2\pi r = 26\text{cm}$