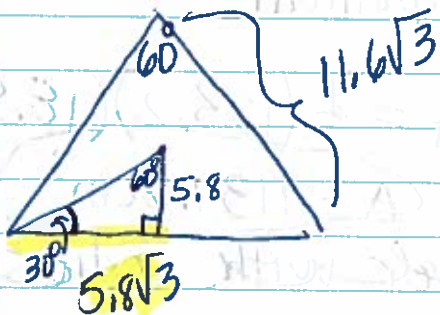


10.5 Trigonometry and Area

Find the area of each regular polygon. Round to nearest tenth.

- ① equilateral Δ with apothem 5.8



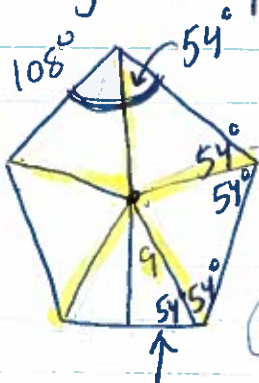
$$P = 3(11.6\sqrt{3})$$

$$P = 34.8\sqrt{3}$$

$$A = \frac{1}{2}(34.8\sqrt{3})(5.8)$$

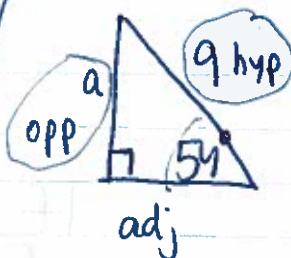
$$A = 174.8 \text{ m}^2$$

- ② regular pentagon with radius 9m



$$(n-2)180^\circ = \text{sum}$$

$$(5-2)180^\circ = 3(180) = 540^\circ / 5 = 108$$



$$\sin 54^\circ = \frac{a}{9}$$

$$a = 7.3 \text{ apothem}$$

$$\cos 54^\circ = \frac{\text{adj}}{9}$$

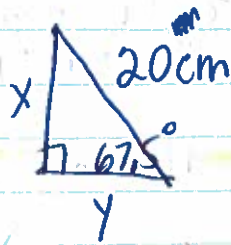
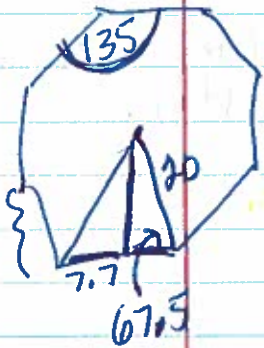
$$\text{adj} = 5.3$$

$$P = 10.6(5) = 53$$

$$A = \frac{1}{2}(53)(7.3) = 193.5 \text{ m}^2$$

$$\frac{(8-2)180^\circ}{8} = \frac{1080}{8} = 135^\circ$$

③ Regular octagon with ~~radius~~ ^{radius} 20cm



$$\sin 67.5 = \frac{x}{20} \quad \cos 67.5 = \frac{y}{20}$$

$$x = 18.5$$

apothem

$$y = 7.7$$

$$\begin{array}{l} 7.7 \\ \times 2 \\ \hline 15.4 = \text{side} \end{array}$$

$$P = 8(15.4)$$

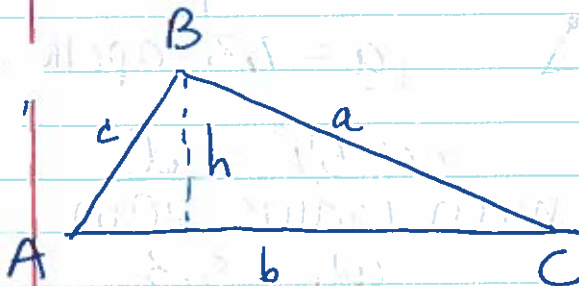
$$P = 123.2$$

$$A = \frac{1}{2}(123.2)(18.5)$$

$$A = 1139.6 \text{ cm}^2$$

⑤ hexagonal pool cover with radius 5ft

HW: p. 561-562 (1-9)



Area
of
a triangle
Given
SAS

If you want to find the area of a triangle, and you only know $m\angle A$ and sides $b + c$ you can use the formula

$$\text{Area} = \frac{1}{2}bc(\sin A)$$

where $\angle A$ is always located between sides b and c