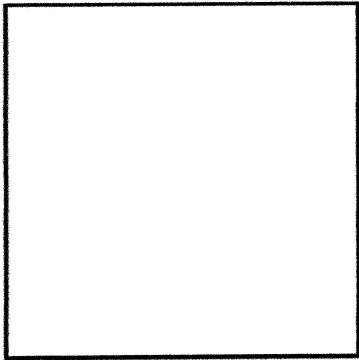


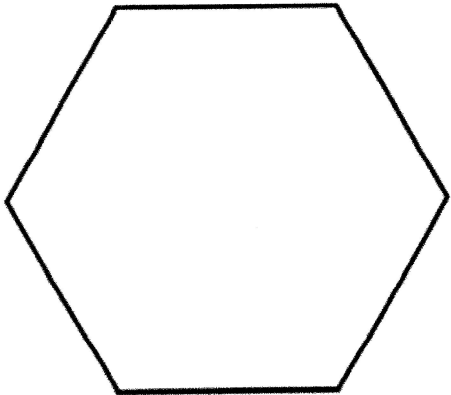
Bellwork Geo Thursday, April 2, 2020

Find the EXACT area of each regular polygon. Give answer in simplified radical form with rationalized denominators.

1. Square with a radius of 20.

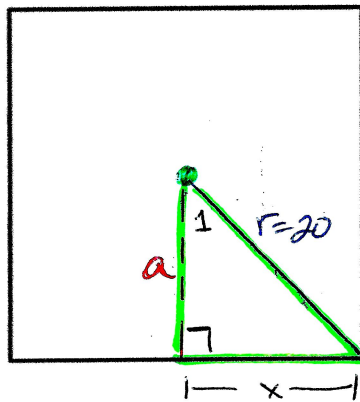


2. Hexagon with an apothem of 7.



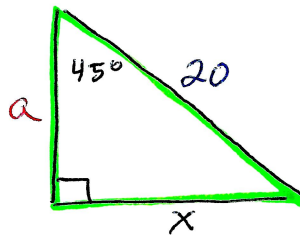
Find the EXACT area of each regular polygon. Give answer in simplified radical form with rationalized denominators.

1. Square with a radius of 20.



$$\text{central } L = \frac{360^\circ}{4} = 90^\circ$$

$$\angle 1 = \frac{1}{2} \text{ central } L = \frac{90^\circ}{2} = 45^\circ$$



$$\begin{aligned} \text{45-45-90 } \Delta \\ \text{Leg} &= \frac{\text{hyp}}{\sqrt{2}} = \frac{20}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\ &= \frac{20\sqrt{2}}{2} = 10\sqrt{2} \end{aligned}$$

$$\text{Leg} = 10\sqrt{2}$$

$$\text{apothem} = \text{Leg}$$

$$\boxed{a = 10\sqrt{2}}$$

$$\begin{aligned} A &= \frac{1}{2} a \cdot P \\ &= \frac{1}{2} (10\sqrt{2})(80\sqrt{2}) \end{aligned}$$

$$\boxed{A = 800}$$

$$\text{Legs are } \cong \text{ so } x = a$$

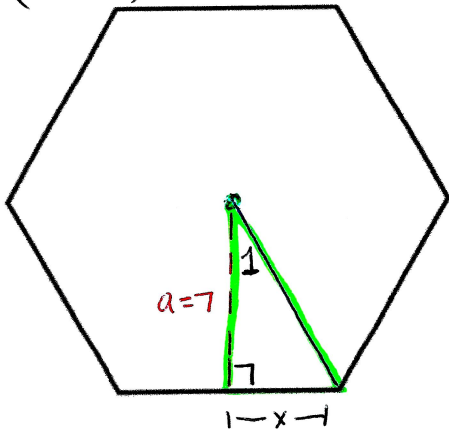
$$x = 10\sqrt{2}$$

$$\text{Side} = 2x = 2(10\sqrt{2}) = 20\sqrt{2}$$

$$\text{perimeter} = 4 \cdot \text{Side} = 4(20\sqrt{2})$$

$$\boxed{P = 80\sqrt{2}}$$

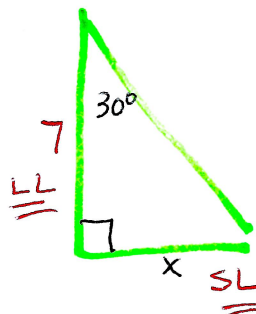
2. Hexagon with an apothem of 7.
(6-sides)



$$\boxed{a = 7}$$

$$\text{central } L = \frac{360^\circ}{6} = 60^\circ$$

$$\angle 1 = \frac{1}{2} \text{ central } L = \frac{60^\circ}{2} = 30^\circ$$



$$\begin{aligned} \text{30-60-90 } \Delta \\ SL &= \frac{LL}{\sqrt{3}} = \frac{7}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} \\ &= \frac{7\sqrt{3}}{3} \end{aligned}$$

$$x = SL = \frac{7\sqrt{3}}{3}$$

$$\begin{aligned} \text{side} &= 2x = 2\left(\frac{7\sqrt{3}}{3}\right) \\ &= \frac{14\sqrt{3}}{3} \end{aligned}$$

$$\begin{aligned} \text{perimeter} &= 6 \cdot \text{side} \\ &= 6\left(\frac{14\sqrt{3}}{3}\right) \end{aligned}$$

$$\begin{aligned} A &= \frac{1}{2} a \cdot P \\ &= \frac{1}{2} (7)(28\sqrt{3}) \end{aligned}$$

$$\boxed{A = 98\sqrt{3}}$$

$$\boxed{P = 28\sqrt{3}}$$