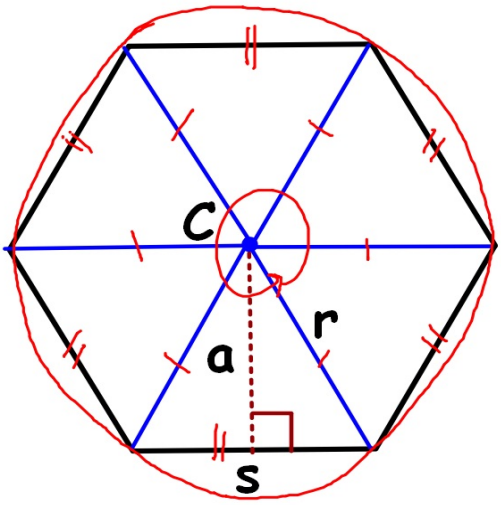
11-4 Regular Polygons

March 7

std. 10.0

= sides, = ∠s

regular hexagon



radius (r): from center to a vertex

apothem (a): from center, ⊥ to side

area of hexagon =

$$\Delta = \frac{1}{2}sa$$

$$6\Delta s = 6\left(\frac{1}{2}sa\right)$$

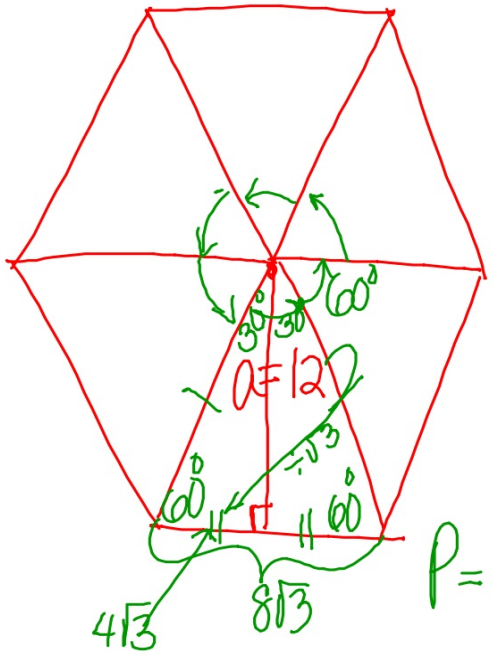
$$\text{hexagon} = \frac{1}{2}(6s)a = \boxed{\frac{1}{2}Pa}$$

P = perimeter

Regular Polygon

Examples--find area

1 regular hexagon with apothem = 12



$$\frac{12}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{12\sqrt{3}}{3} = 4\sqrt{3}$$

$$A = \frac{1}{2} p a$$

$$\frac{1}{2}(48\sqrt{3})(12) = 288\sqrt{3}$$

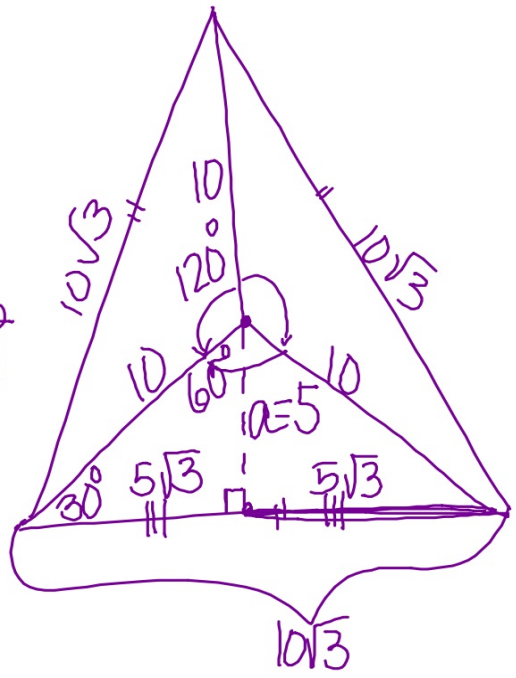
$$P = 6 \cdot 8\sqrt{3}$$

2 equilateral triangle with radius = 10 cm

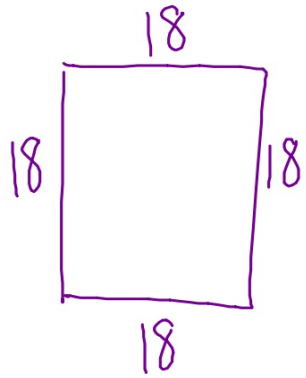
$$A = \frac{1}{2} p a$$

$$= \frac{1}{2}(30\sqrt{3})5$$

$$= 75\sqrt{3}\ \text{cm}^2$$



3 square with perimeter 72 inches



$A = 18 \cdot 18$

324 in^2