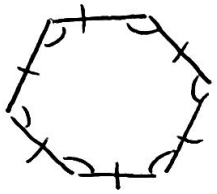
11.4 Area of a Polygon

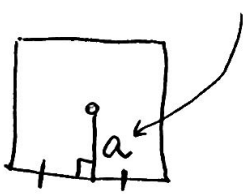
Polygon - closed shape with 3 or more sides.

Regular polygon - all sides and angles are congruent

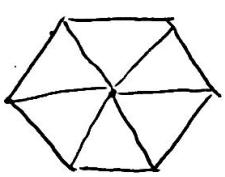


radius of a polygon - center to the vertex

apothem - center to the side (perpendicular to the side)

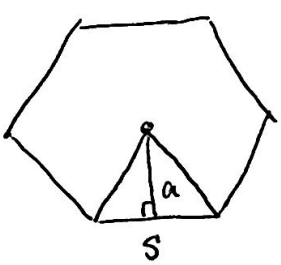


Background Info



How many triangle? 6

* Number of sides of the polygon is also 6.



Area of a triangle

$A = \frac{1}{2}bh$

$A = \frac{1}{2}s(a)$

$A = \frac{1}{2}s(a)(n)$

$\boxed{A = \frac{1}{2}a(n)(s)}$

$A = \frac{1}{2}a(n \cdot s)$

$A = \frac{1}{2}aP$

Use a (apothem) for h.

Use s (length of side) for b.

mult by n (number of sides)

Perimeter (P) is $(n \cdot s)$

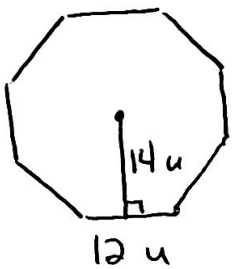
$\boxed{A = \frac{1}{2}Pa}$

Area of a Regular Polygon

$A = \frac{1}{2}Pa$ or $A = \frac{1}{2}a(n)(s)$

$A = \frac{1}{2}a(P)$
$A = \frac{1}{2}a(n \cdot s)$

ex:

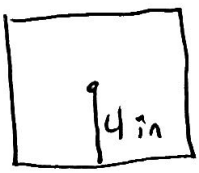


$a = 14$
$n = 8$
$s = 12$

$A = \frac{1}{2}(14)(8 \cdot 12)$

$= 672\ u^2$

ex:



$A = \frac{1}{2}(a)(n)(s)$ or $A = \frac{1}{2}Pa$

$A = \frac{1}{2}(4)(4)(8)$ $A = \frac{1}{2}(4 \cdot 8)(4)$

$= 64\ in^2$

Another way
$A = s^2$
$A = 8^2$
$A = 64$

* Don't forget Bonus and make sure to show your work.