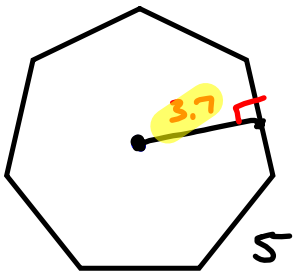
Geometry 11.3

Area of Regular Polygons.

Formula: $A = \frac{1}{2} \cdot (\text{Perimeter of polygon}) \cdot (\text{distance From center to edge of Polygon})$

Ex



$A = \frac{1}{2}(35)(3.7)$

$= 64.75 \text{ units}^2$

Perimeter: Distance all the way around a shape

in a regular polygon, all sides are the same length.

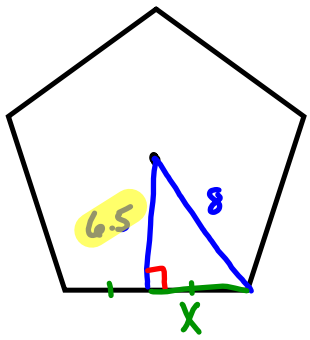
$P = 5 + 5 + 5 + 5 + 5 + 5 + 5$

$= 5 \cdot 7$

$= 35$

11.3 Loose Notes - Area of Regular Polygons

Ex:



$A = \frac{1}{2}(6.5)(46.6)$

$A \approx 151.45$

Use pythagorean theorem:

$6.5^2 + x^2 = 8^2$

$42.25 + x^2 = 64$

$-42.25 \quad -42.25$

$\sqrt{x^2} = \sqrt{21.75}$

$x \approx 4.66$

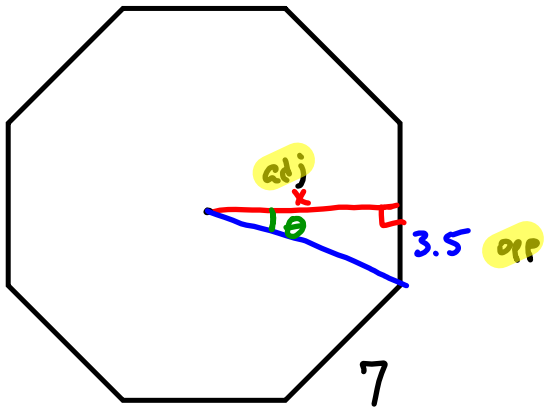
The Perimeter is 10 times x b/c one side is 2x and there are 5 sides.

So $5 \cdot 2x = 10x$

$P = 10x \approx 46.6$

11.3 Loose Notes - Area of Regular Polygons

Ex: SOH CAH TOA



$A = \frac{1}{2}(56)(x)$

we don't know. so we need to find it.

Perimeter: $7 \cdot 8 = 56$

length of side — 8 sides

$\theta = 360 \div 16$

$= 22.5$

Finding x.

$\tan 22.5^\circ = \frac{3.5}{x}$

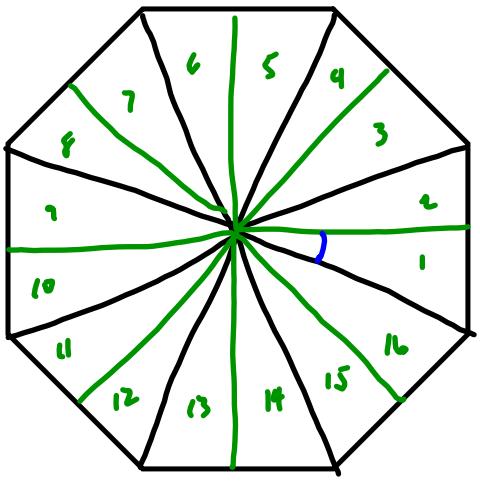
$x = \frac{3.5}{\tan 22.5^\circ}$

$x \approx 8.45$

$A \approx \frac{1}{2}(56)(8.45)$

$A \approx 236.6 \text{ units}^2$

Why divide by 16?



All the way around a circle is 360°

You can break the octagon into 16 of the triangles we drew.

So divide 360 by 16 to find the angle.

Homework:

Pg 554

#s 19-22