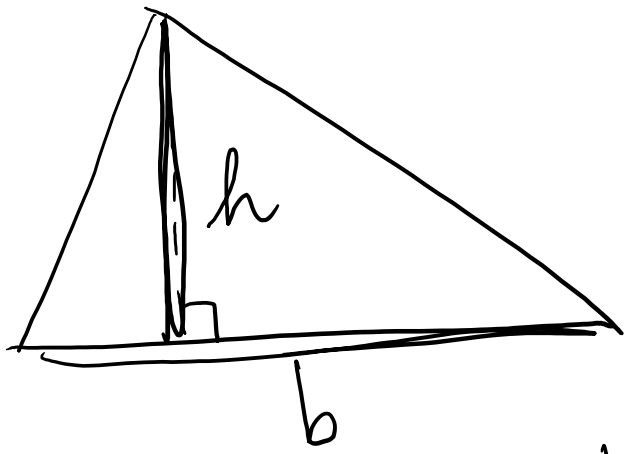
Geometry

Triangles



$$\text{Area} = \frac{1}{2} \cdot b \cdot h$$

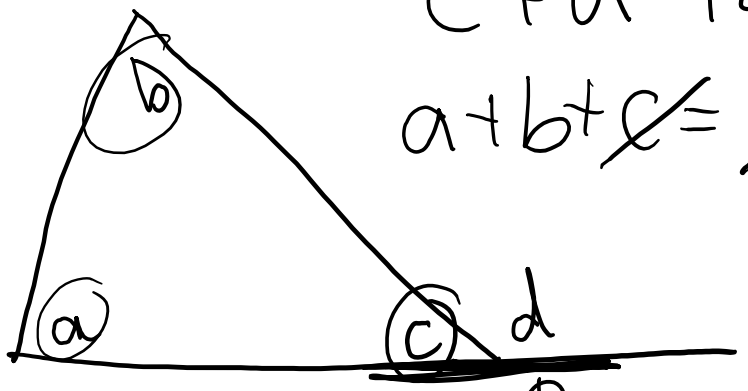
$$a + b + c = 180$$

$$c + d = 180$$

$$a + b + \cancel{c} = \cancel{c} + d$$

$$a + b + c = 180^\circ$$

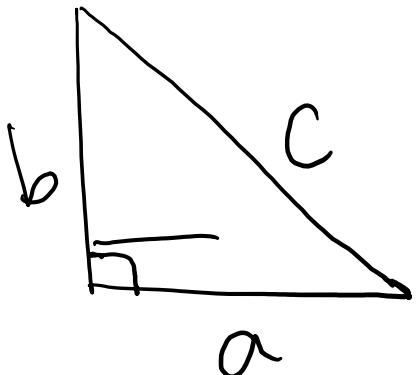
$$d = a + b$$



exterior angle

triangle with a 90° angle

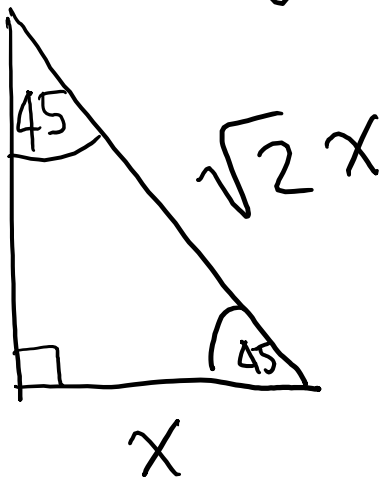
Right Triangles



Pythagorean Theorem:

$$a^2 + b^2 = c^2$$

Special Right triangles

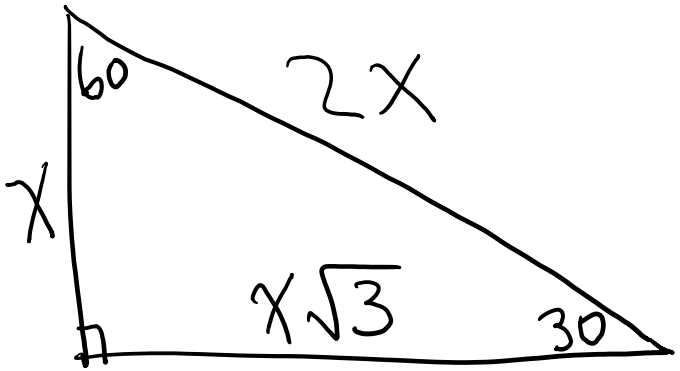


45-45-90

$$x^2 + x^2 = c^2$$

$$2x^2 = c^2$$

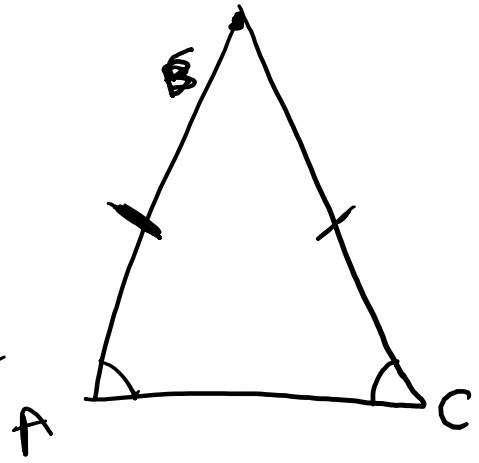
$$c = x\sqrt{2}$$



30-60-90

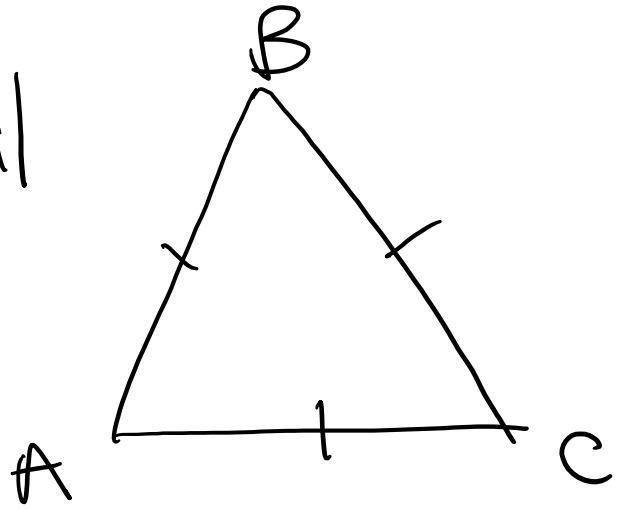
Isoceles Triangles

- 2 sides are equal
- 2 base angles are congruent



Equilateral Triangles

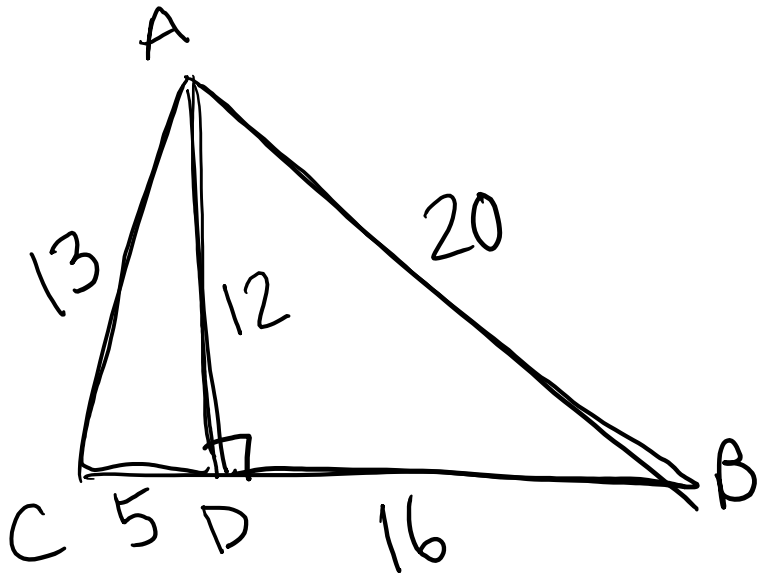
- all 3 sides are equal



$\angle A + \angle B + \angle C = 180^\circ$

$\angle A = \angle B = \angle C = \boxed{60^\circ}$

Find the area of $\triangle ABC$. $\overline{AD}$ is perpendicular to $\overline{CB}$.



$\left.\begin{array}{l}\triangle ACD \\ \triangle ADB\end{array}\right\}$ Rt $\triangle$'s

$\frac{1}{2}bh = \frac{1}{2}(5+16)(12)$

$= 126$

5 - 12 - 13

$5^2 + AD^2 = 13^2$

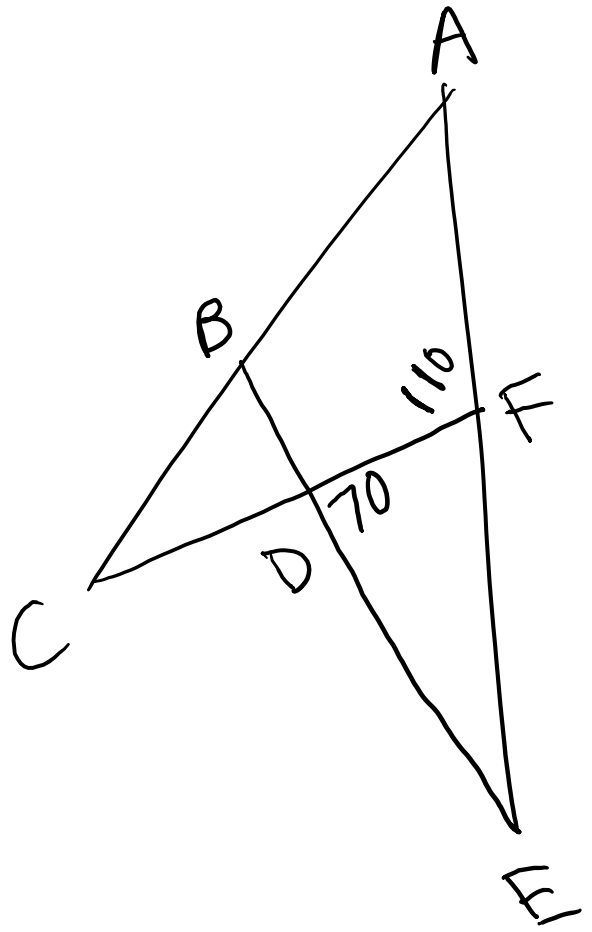
$25 + AD^2 = 169$

$AD^2 = 144$ $AD = 12$

(x4) 12 - 16 - 20

3 - 4 - 5

What is the measure of $\angle DEF$?



$\angle EDF = 70$

$\angle AFD = 110$

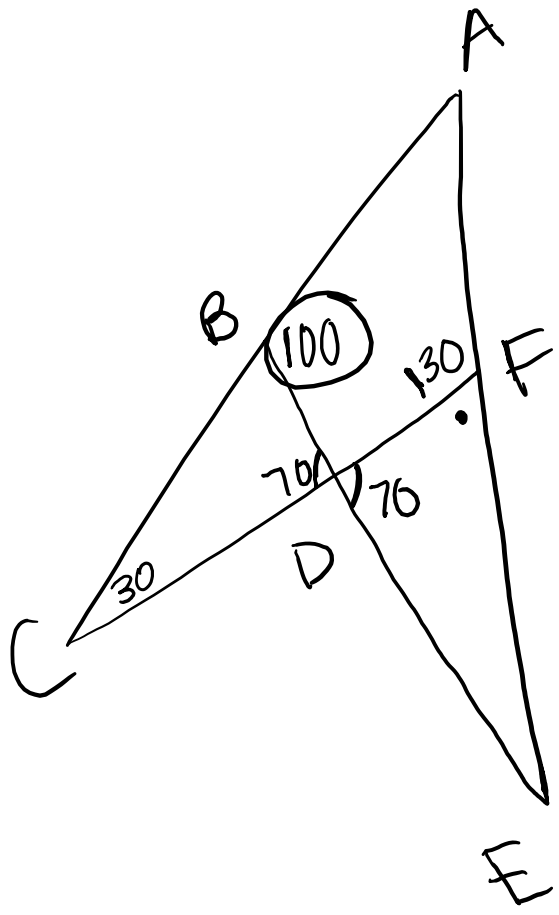
$m\angle DEF = 180 - 70 - (180 - 110)$

$= 40$

$70^\circ + \angle DEF = 110$

$\angle DEF = 40$

What is the measure of $\angle DEF$?



$30 + \angle BDC = 100$

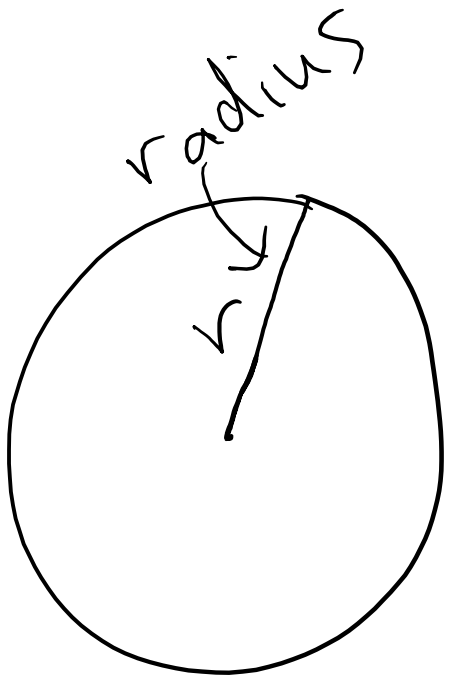
$\angle BDC = 70 = \angle FDE$

vertical $\angle$'s

$70 + \angle DEF = 130$

$\angle DEF = 60$

Circles



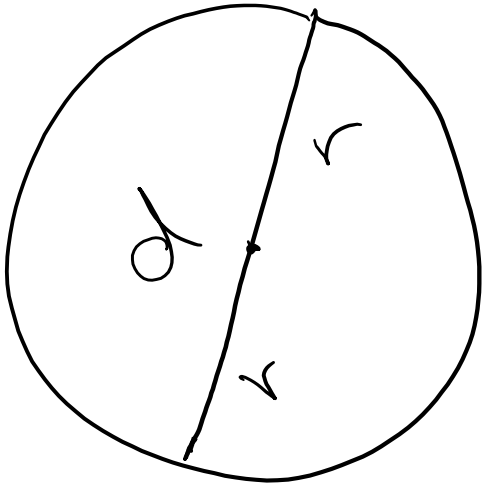
Area

$$A = \pi r^2$$

circumference

$$C = 2\pi r = 2r\pi$$

$$= d\pi$$

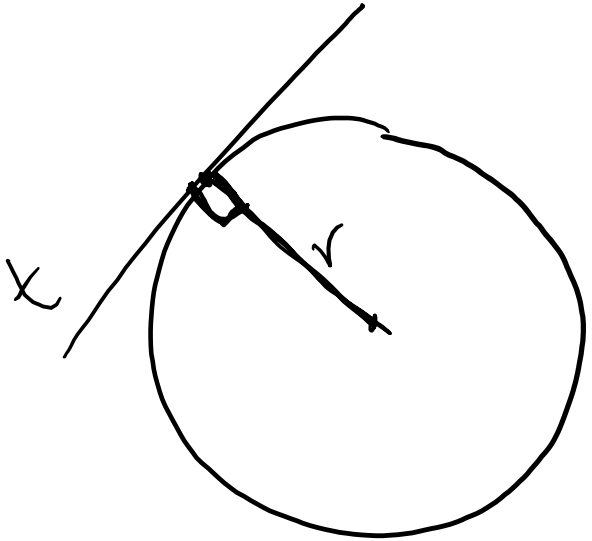


diameter

$$d = 2r$$

$$\pi = 3.14$$

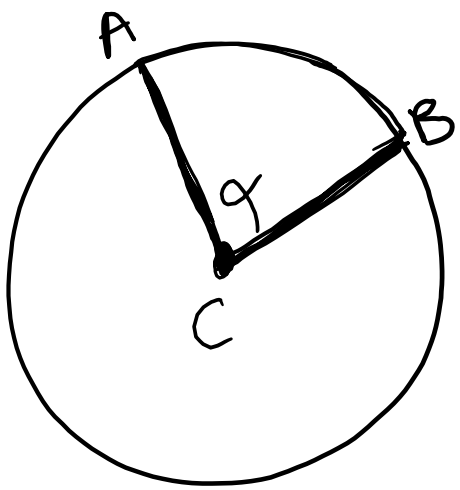
Tangents



- line that touches the circle at one point

Inscribed Angles

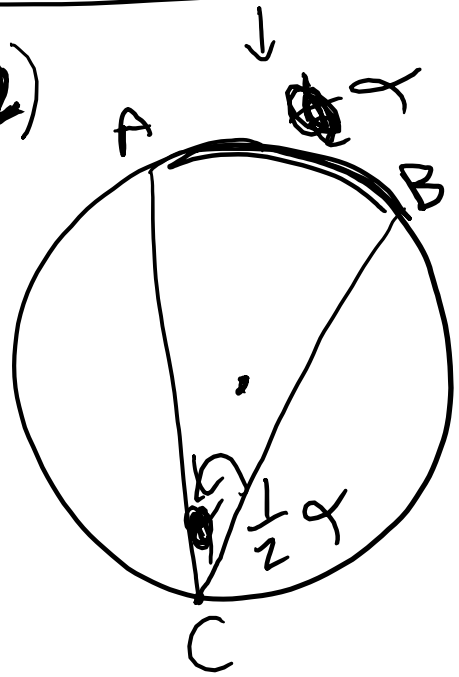
1)



$\angle ACB = \alpha$

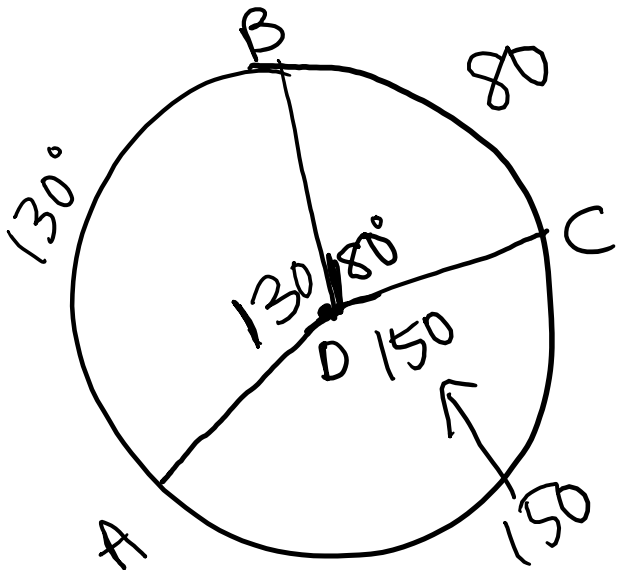
$m\widehat{AB} = \alpha$

2)



3)

$\angle BDC = 80^\circ$ $\quad m\widehat{AB} = 130^\circ$



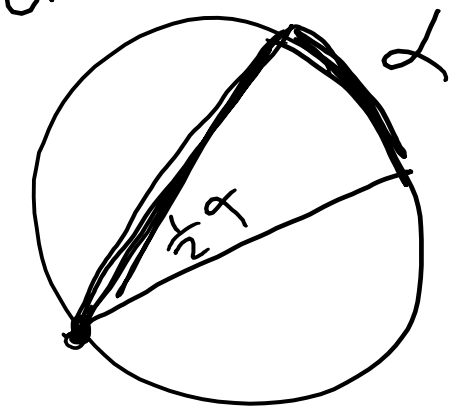
Find $\angle ADC$.

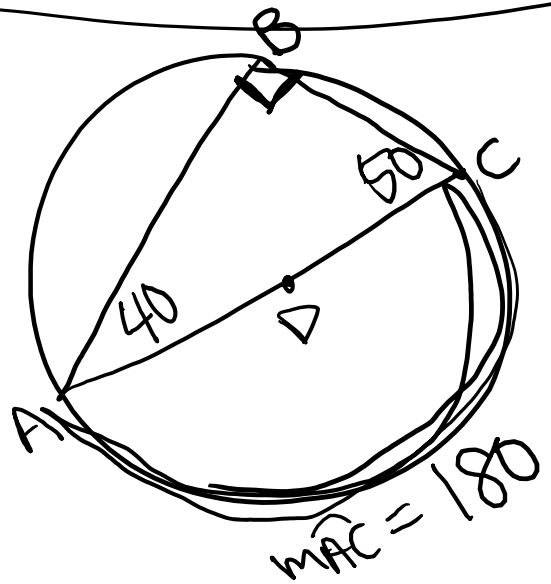
$130 + 80 + x = 360$

$210 + x = 360$

$x = 150$

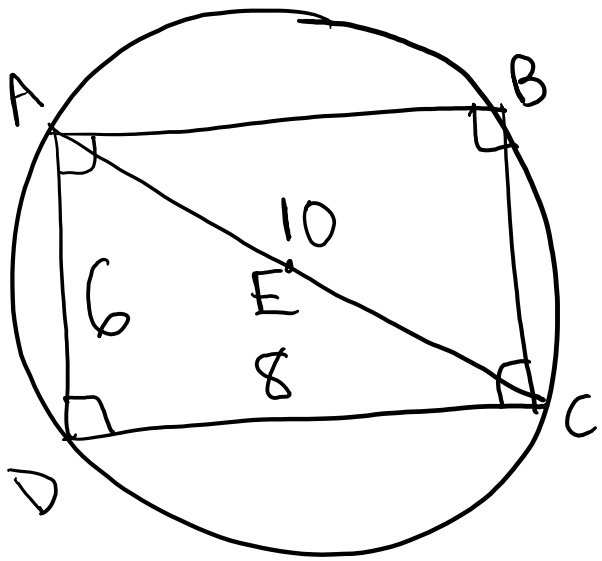
on the circle





AC is a <u>diameter</u>.

$\angle BAC = 40^\circ$. Find $\angle ACB$.



$\overline{AC} = 10$ and $\overline{AC}$ is a diameter. Find the area of the circle that is outside of the rectangle. (leave answer in terms of π)

$\times 2$ (3-4-5)

$6 \cdot 8 = 48$

$r = \frac{10}{2} = 5$

area circle − area of rect $= 5^2\pi - 48$

$= 25\pi - 48$