### HW #3 - Due Fri. 3/17

11.6
- set I p. 463 #1-8; 23-30 (slope & distance)
- set II p. 466 #52-65 (proofs w/ parallel, perpendicular lines)

11.7
- set I p. 471-472 #12-17 (law of sines, law of cosines)

### Test #1 - Monday 3/20

Upcoming:

12.1 p. 487 #16-26; p. 488 #34-36; p. 498 #37-39

12.2 p. 493 #8-18

12.3 p. 501 #23-29; p. 502-503 #43-47

12.4 p. 508 #35-42

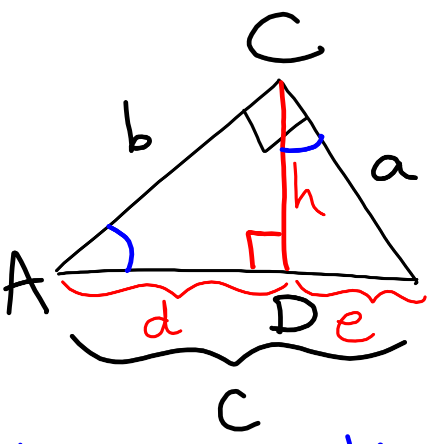
12.5 p. 513 #22-38

12.6 p. 518 #11-15

Ch 12 Review pp. 523-524 #9-16; p. 525 #45-50; p. 526 #55-61

$\cos A = \sim$

$A = \cos^{-1}(\sim)$




$\sin A = \frac{a}{c} = \frac{h}{b} = \frac{e}{a} = \sin\angle DCB$

$A = \sin^{-1}\left(\frac{a}{c}\right)$

$\cos A = \frac{b}{c} = \frac{d}{b} = \frac{h}{a} = \cos\angle DCB$

$A = \cos^{-1}\left(\frac{b}{c}\right)$

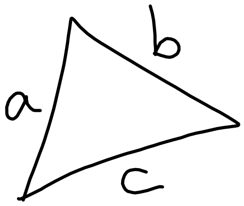
$\tan A = \frac{a}{b} = \frac{h}{d} = \frac{e}{h} = \tan\angle DCB$

$A = \tan^{-1}\left(\frac{a}{b}\right)$

h is the geometric mean betw d & e $\quad \frac{d}{h} = \frac{h}{e}$ or $\frac{h}{d} = \frac{e}{h}$

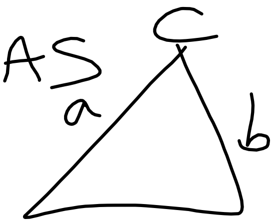
b is the geometric mean between c & d $\quad \frac{c}{b} = \frac{b}{d}$

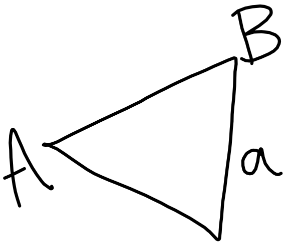
a is the geometric mean between c & e $\quad \frac{c}{a} = \frac{a}{e}$




SSS or SAS

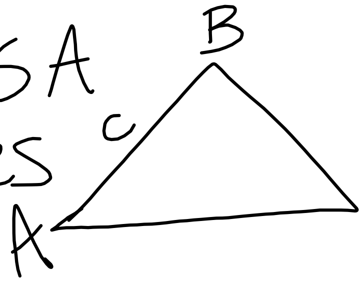
Law of Cosines




AAS or ASA

Law of Sines




find $\angle A$ given $a, b, c$

$$a^2 = b^2 + c^2 \underbrace{- 2bc\cos A}$$

$$2bc\cos A = b^2 + c^2 - a^2$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$A = \cos^{-1}\left(\frac{b^2 + c^2 - a^2}{2bc}\right)$$

Find side $a$, given $b, c, \& \angle A$

$$a = \sqrt{b^2 + c^2 - 2bc\cos A}$$

find a given $\angle A$, $\angle B$, & b

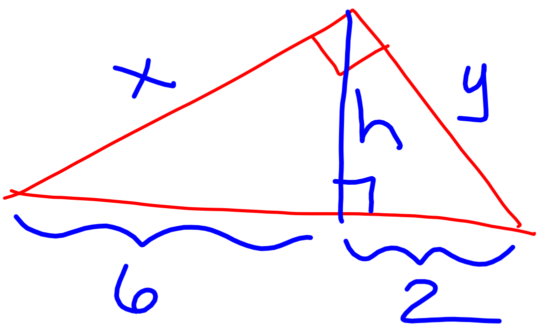
$$\frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \boxed{a = \frac{b \sin A}{\sin B}}$$

find $\angle A$ given a, b, & $\angle B$

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

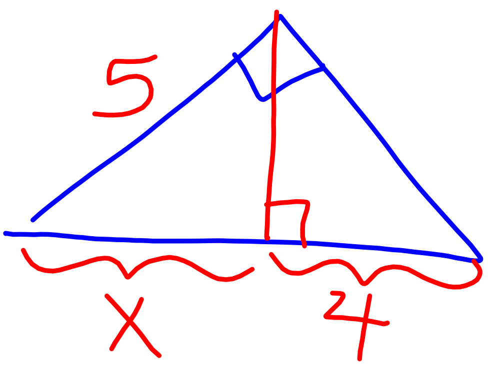
$$\sin A = \frac{a \sin B}{b}$$

$$A = \sin^{-1}\left(\frac{a \sin B}{b}\right)$$

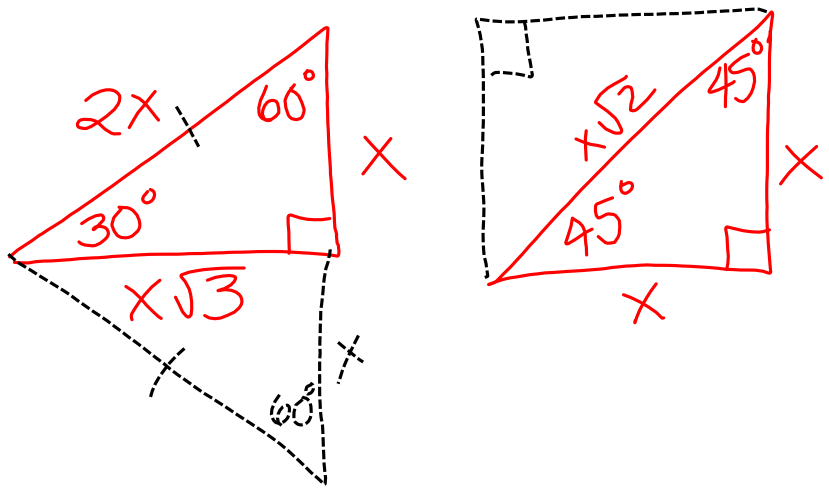



$$\frac{6}{x} = \frac{x}{6+2}$$

$$\frac{2}{y} = \frac{y}{2+6}$$




$$\frac{x}{5} = \frac{5}{x+4}$$




## Chapter 12: Circles

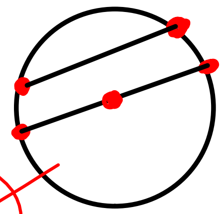
### 12.1 - Circles, Radii, and Chords

Def: A **circle** is the set of all points in a plane that are at a given distance from a given point in the plane.

Def: Circles are **concentric** iff they lie in the same plane and have the same center.

Def: A **radius** of a circle is a line segment that connects the center of the circle to any point on it.
*The* radius of a circle is the length of one of these line segments.

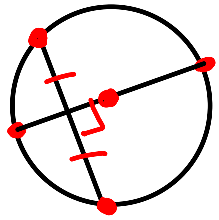
**Corollary**: All radii of a circle are equal.



Def: A **chord** of a circle is a line segment that connects two points of the circle.

Def: A **diameter** of a circle is a chord that contains the center. *The* diameter of a circle is the length of one of these chords.

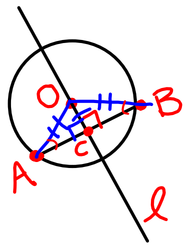
**Theorem 56**: If a line through the center of a circle is perpendicular to a chord, it also bisects the chord.



**Theorem 57**: If a line through the center of a circle bisects a chord that is not a diameter, it is also perpendicular to the chord.

**Theorem 58**: The perpendicular bisector of a chord of a circle contains the center of the circle.

**Theorem 56**: If a line through the center of a circle is perpendicular to a chord, it also bisects the chord.




Given : circle O
line ℓ through O
chord AB ⊥ ℓ

To show: ℓ bisects AB
(AC = CB)

Proof :

1. Draw OA & OB — 2 pts define a line
2. OC = OC — reflexive prop.
3. ∠OCB = ∠OCA = 90° — ⊥ lines form all equal right ∠'s
4. OA = OB — all radii are =
5. $\frac{AC}{OA} = \frac{OA}{AB}$ $\frac{BC}{OB} = \frac{OB}{AB}$ — projection
6. $AC = \frac{OA^2}{AB}$ $BC = \frac{OB^2}{AB}$ — mult
7. $AC = \frac{OB^2}{AB} = BC$ — subst

2 ∠'s = opposite sides are =
ASA ≅ or AAS
corresponding parts