

①

Pull out your Alg/Geometry

HW Help →

Reference Sheet ← the Purple Sheet

②

Then pick up the Warm Up

Missed an LCQ ?



① Fill in the boxes

$$1^2 = \boxed{1} \quad 2^2 = \boxed{4} \quad 3^2 = \boxed{9} \quad 4^2 = \boxed{16}$$

$$5^2 = \boxed{25} \quad 6^2 = \boxed{36} \quad 7^2 = \boxed{49} \quad 8^2 = \boxed{64}$$

$$9^2 = \boxed{81} \quad 10^2 = \boxed{100} \quad 11^2 = \boxed{121} \quad 12^2 = \boxed{144}$$

$$13^2 = \boxed{169} \quad 14^2 = \boxed{196} \quad 15^2 = \boxed{225}$$

② All the numbers inside the boxes above are examples of numbers called **Perfect Squares**

③ Certain types of quadratic expressions can be factored using a shortcut. Look at the first few examples. Then complete the rest.

$$n^2 - 9 = (n+3)(n-3)$$

$$x^2 - 64 = (x+8)(x-8)$$

$$t^2 - 100 = (t+10)(t-10)$$

$$z^2 - 4 = (z+2)(z-2)$$

$$n^2 - 25 = (n+5)(n-5)$$

$$m^2 - 144 = (m+12)(m-12)$$

$$p^2 - 1 = (p+1)(p-1)$$

$$\cancel{x^2 - 225} = (x+15)(x-15)$$

$$3 \cdot 4$$

$$(n-12)(n+12)$$

$$a^2 - b^2 = (a+b)(a-b)$$

$$n^2 - 10$$

- ④ The short cut factoring method you just practiced is called "factoring using Difference of Squares" a.k.a. DOS

⑤ Using this shortcut solve the quadratic equation:  $n^2 - 36 = 0$

$$\sqrt{n^2} = \sqrt{36}$$

$$n = \pm 6$$

$$(n+6)(n-6) = 0$$

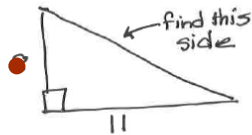
↙ ↘

$$n+6=0 \quad n-6=0$$

$$n=-6 \quad n=6$$

$$a^2 + b^2 = c^2 \quad \text{leg}^2 + \text{leg}^2 = \text{hypotenuse}^2$$

- ⑥ Right Triangle Geometry baby!



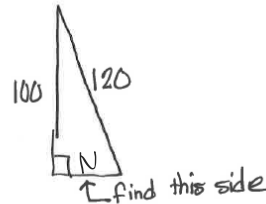
$$8^2 + 11^2 = X^2$$

$$\sqrt{X^2} = \sqrt{8^2 + 11^2}$$

$$X = \sqrt{8^2 + 11^2} = \sqrt{185}$$

64 + 121      exact

- ⑦



$$100^2 + N^2 = 120^2$$

$$-100^2 \quad -100^2$$

$$N^2 = 120^2 - 100^2$$

$$N = \sqrt{120^2 - 100^2}$$

$$N = \sqrt{4400}$$

$$\approx \underline{\underline{66.33}}$$

## Questions on HW

### **Mid Chapter HW Check**

**As you check your HW, I will walk around and check your work.**

**Have out, on your desk, your HW and ALL HW you have done up to this point.**

**You may NOT write any additional scores or information on your recording sheet at this point.**

47

$$f(x) = \frac{1}{x}$$

$$(a) \quad f\left(\frac{1}{2}\right) = \frac{1}{\frac{1}{2}} =$$

$$(b) \quad f\left(\frac{1}{10}\right) =$$

$$(c) \quad f(.01) = \frac{1}{.01} =$$

$$(d) \quad f(.007) = \frac{1}{.007} \approx$$

48<sub>a</sub>

$$x^2 - 8x + 15 = 0$$

$$( \quad )( \quad ) = 0$$

$x^2$	
	15

~~$-8x$~~

$$\begin{array}{l} 1 \times 15 \\ -1 \times -15 \\ -3 \times -5 \\ 3 \times 5 \end{array}$$

486  $2x^2 - 5x - 6 = 0$   
can't be factored

$a=2$   $b=-5$   $c=-6$

$2x^2$	
	$-6$

~~$-2x^2$   
 $-5x$~~

$-1x \quad 12x$   
 $1x \quad -17x$   
 $-2x \quad 6x$   
 $2x \quad -6x$   
 $-3x \quad 4x$   
 $3x \quad -4x$

Can't be factored

486  $2x^2 - 5x - 6 = 0$   
can't be factored

$a=2$   $b=-5$   $c=-6$

$$X = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(-6)}}{2(2)} = \frac{5 \pm \sqrt{73}}{4}$$

$$X = \frac{(5 + \sqrt{73})}{4} \approx 3.39$$

$$X = \frac{5 - \sqrt{73}}{4}$$

49

 $(-5, 0)$   $(0, 3)$ distance formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(-5 - 0)^2 + (0 - 3)^2}$$

$$\sqrt{25 + 9} = \sqrt{34}$$

slope

$$m = \frac{0 - 3}{-5 - 0}$$

$$= \frac{-3}{-5}$$

$$= \left(\frac{3}{5}\right)$$

51

$$4.1x = 9.5x + 23.7$$

$$-4.1x = -4.1x$$

$$5.4x = 23.7$$

$$\frac{5.4x}{5.4} = \frac{23.7}{5.4}$$

$$x = 4.39$$



error  
is 2.

52 a

$$3.9x - 2.1 = 11.2x + 51.7$$

52 b

$$\frac{1}{5}x - 2 = \frac{13}{25} - 0.7x$$



Agenda : Revisit Trigonometry from Geometry

NOTES

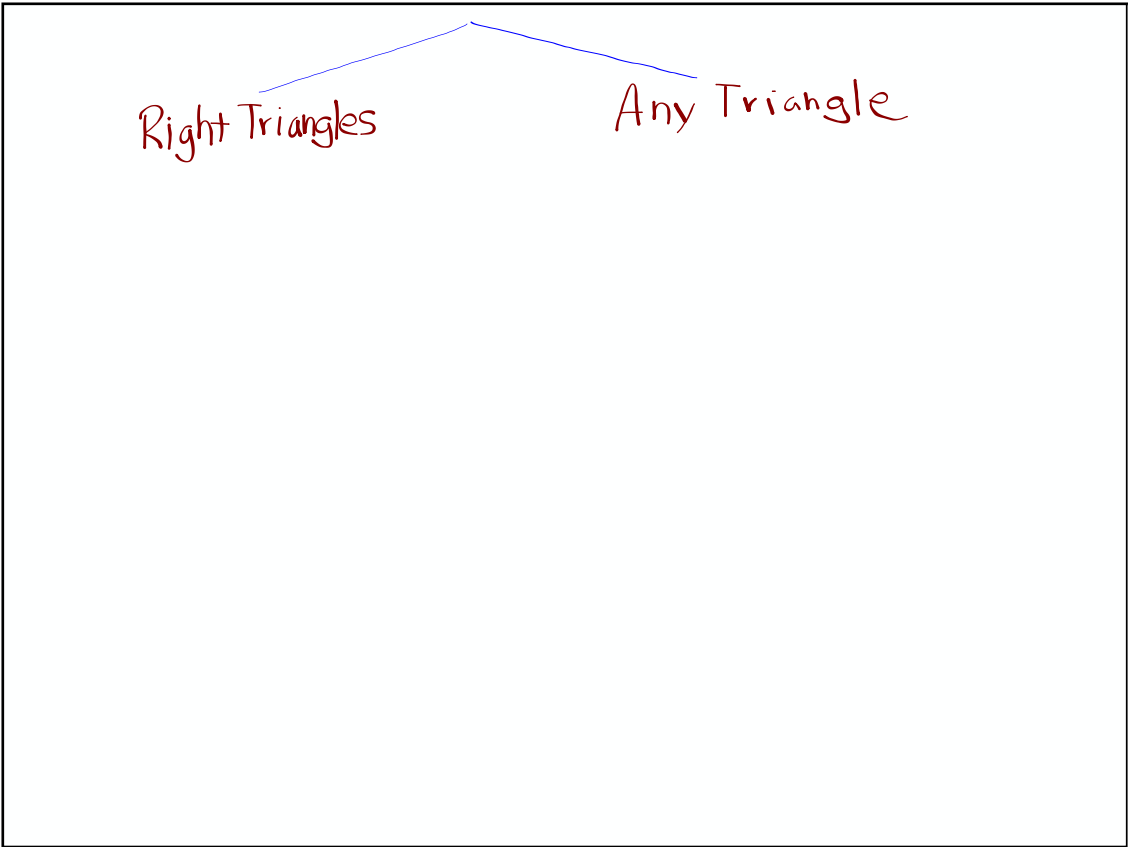
Right Triangles

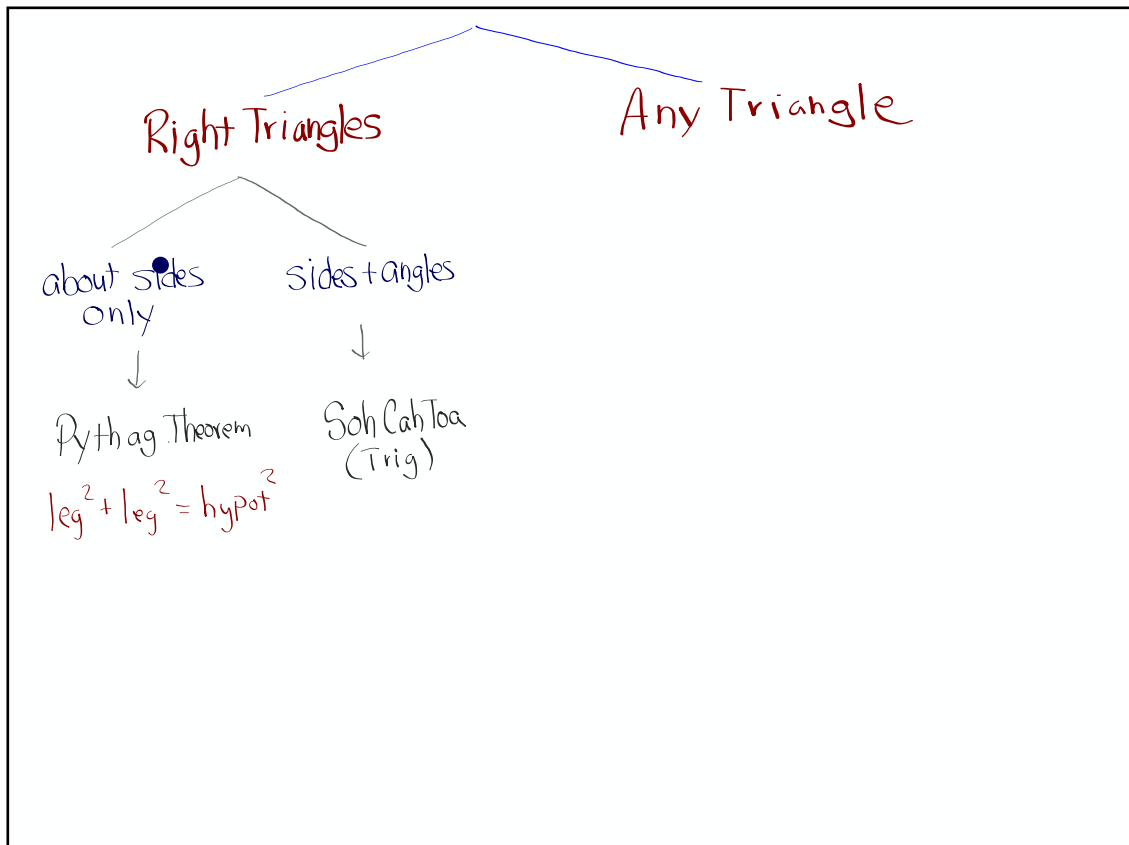
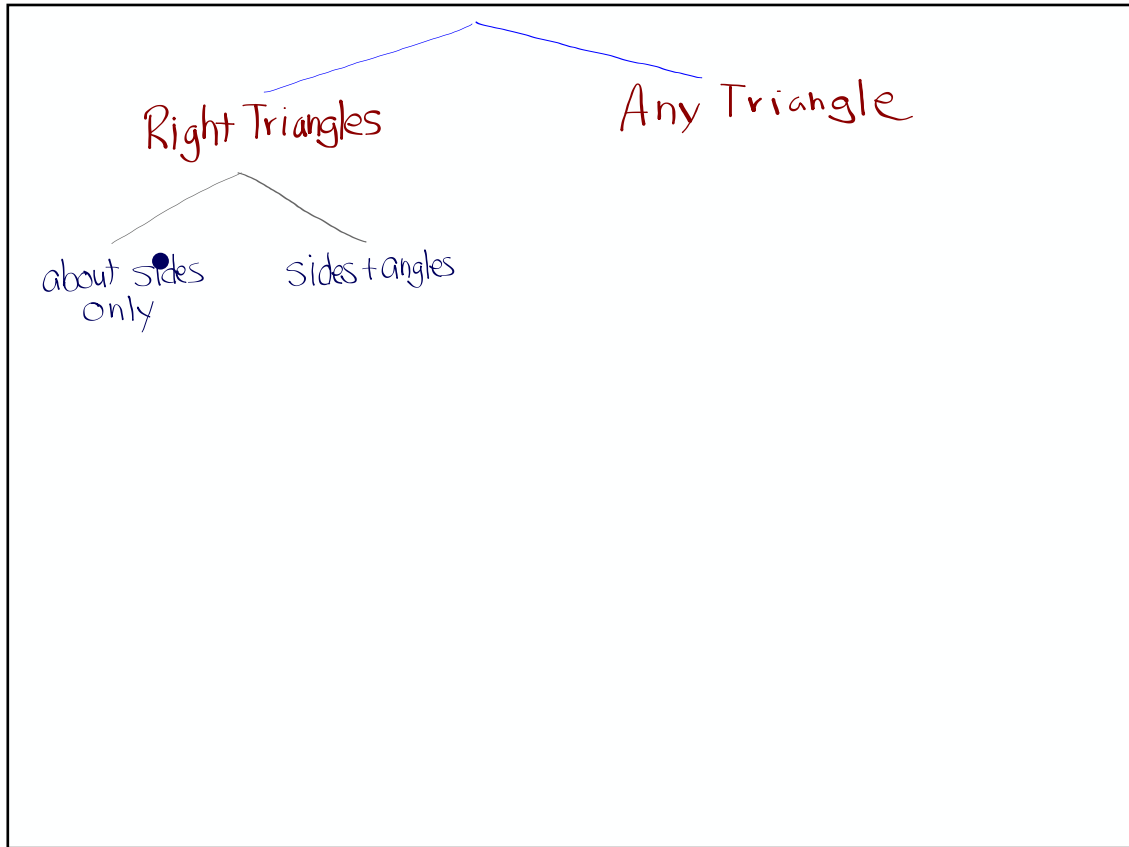
- Pythagorean Theorem
- Soh Cah Toa

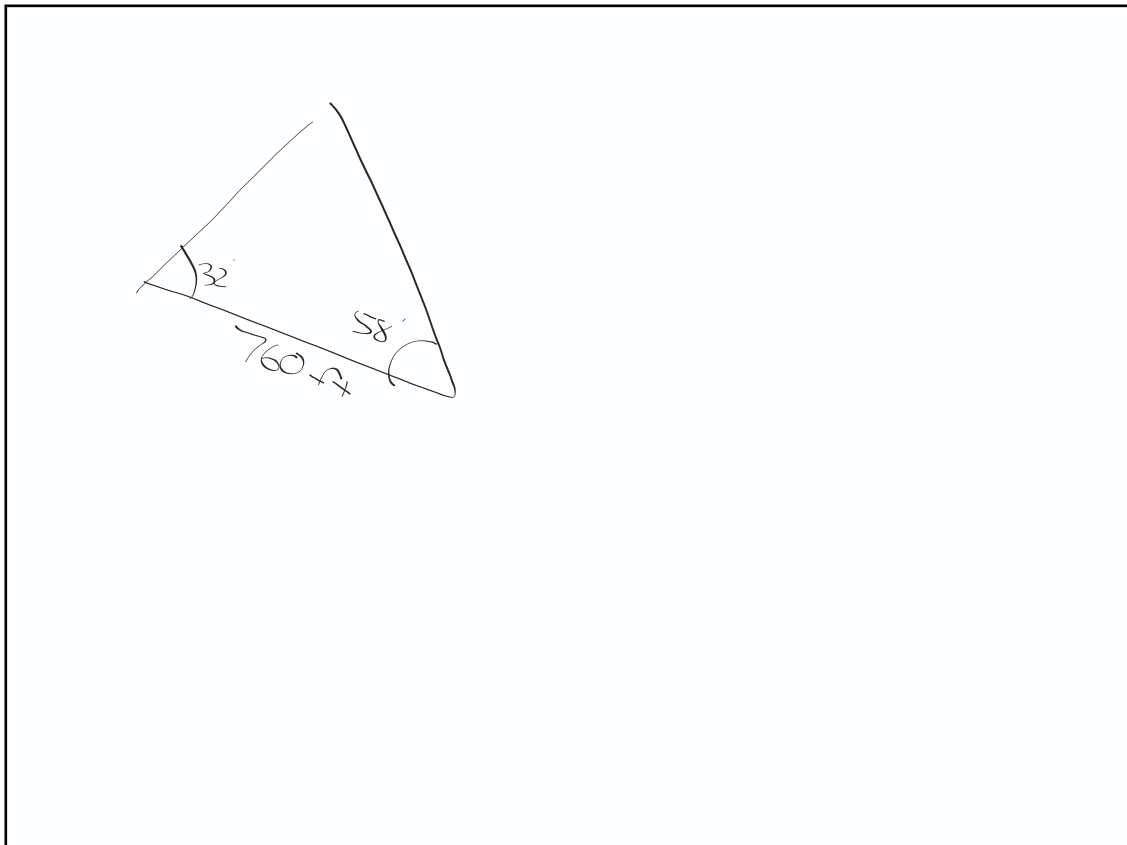
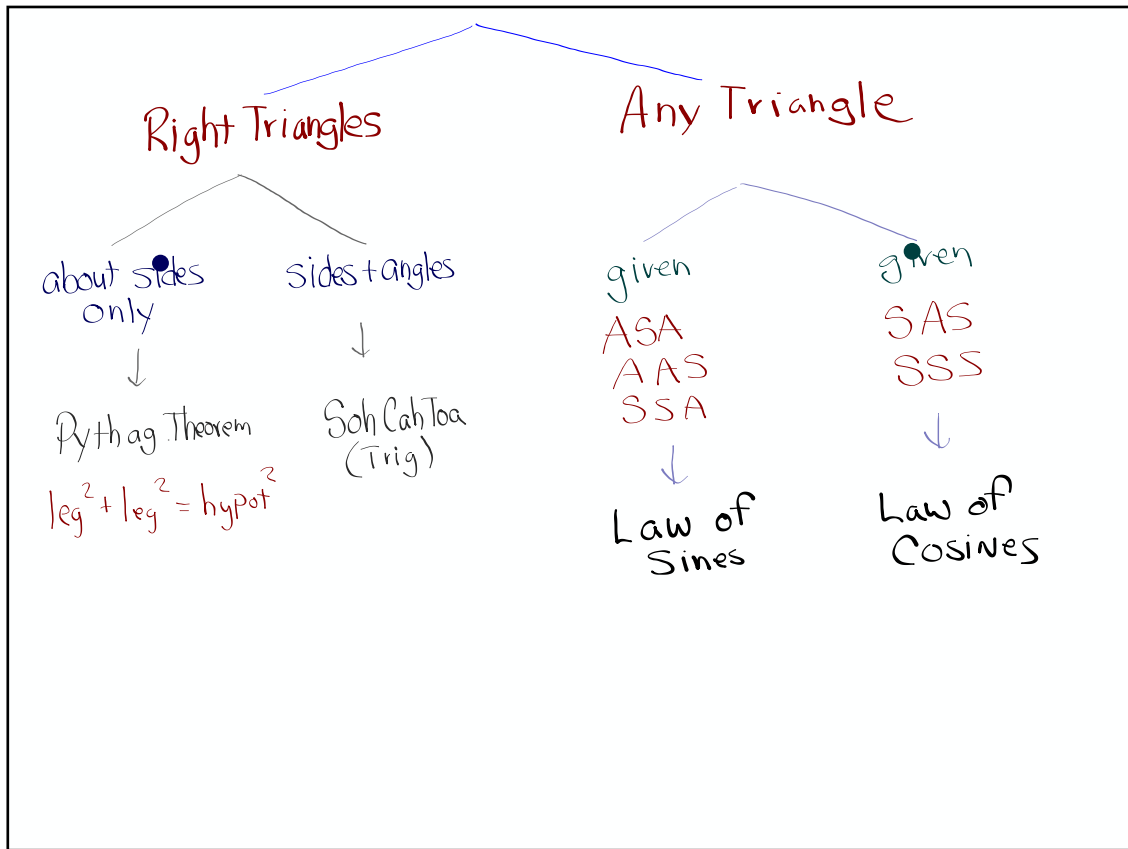
All triangles

- Law of Sines
- Law of Cosines

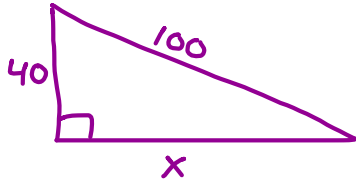
LCQ



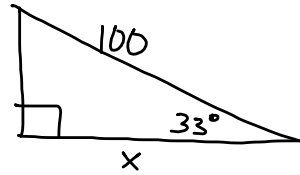




# What is the main difference ?

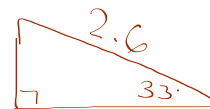
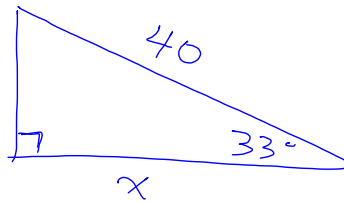
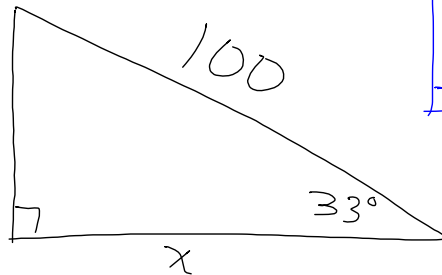


Could use Pythag. Theorem

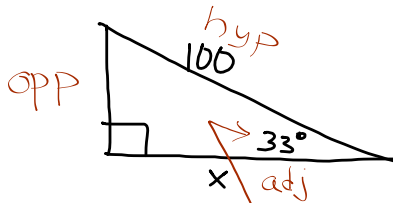


Can't

but the ratios of sides  
in all  $33^\circ$  right triangles  
are the same!



Use SOH-CAH-TOA to solve for missing lengths.



↑  
Cosine

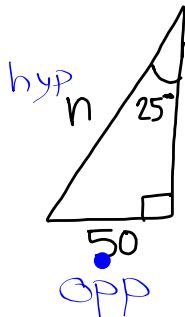
**S** Sine  
o opposite  
h hypotenuse

**C** Cosine  
a adjacent  
h hypot.

**T** tangent  
o opp.  
a adjacent

a

①



Soh Cah Toa

$$\sin(\text{angle}) = \frac{\text{ratio}}{\text{hypotenuse}}$$

$$\sin(25^\circ) = \frac{50}{n}$$

$$n \cdot \sin(25^\circ) = 50$$

$$n = \frac{50}{\sin 25}$$

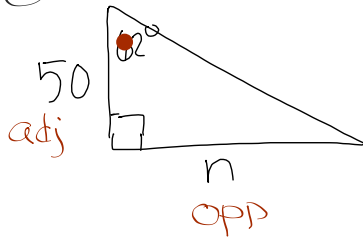
$$n = \frac{50}{\sin(25^\circ)}$$

$$\approx 118.31 \text{ mm}$$

$$\frac{3}{6} = \frac{2}{4} \quad \frac{3}{2} = \frac{6}{4}$$

$$\frac{4}{6} = \frac{2}{3}$$

②

Soh Cah Taa

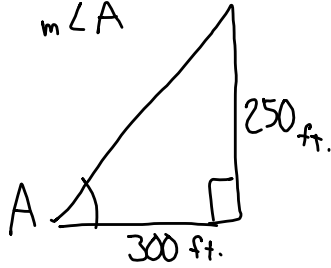
$$\tan(62^\circ) = \frac{n}{50}$$

mult by 50

$$n = 50 \cdot \tan(62^\circ)$$

$$= \cancel{404}94.04$$

③

Calculate  
 $m\angle A$ 

$$\tan(A) = \frac{250}{300}$$

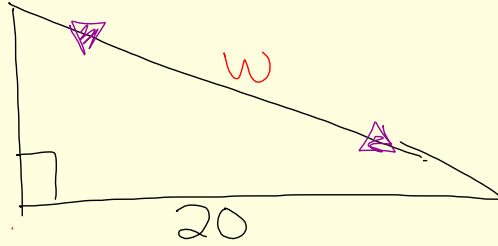
$$\tan^{-1}(\tan(A)) = \tan^{-1}\left(\frac{250}{300}\right)$$

$$A = \tan^{-1}\left(\frac{250}{300}\right)$$
$$\approx 39.8^\circ$$

3·n      n<sup>2</sup>

Right Triangles vs Non-Right Triangles

$$c^2 = a^2 + b^2 - 2ab \cos C$$



So what would happen if we stretched the hypotenuse?

Law of Cosines

$$c^2 = a^2 + b^2 - 2ab \cdot \cos C$$

side — opposites — angle



**Geometry**

in right triangles: Can use both the Pythagorean Theorem  $a^2 + b^2 = c^2$  if only dealing with sides

or Soh-Cah-Toa  $\text{sine } A = \frac{\text{opposite}}{\text{hypotenuse}}$ ,  $\text{cosine } A = \frac{\text{adjacent}}{\text{hypotenuse}}$ ,  $\text{tangent } A = \frac{\text{opposite}}{\text{adjacent}}$

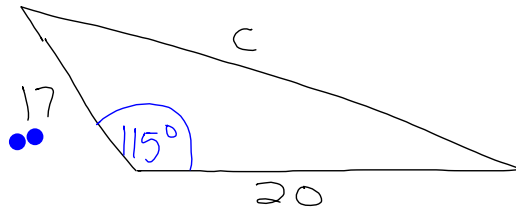
Any triangle: Law of Sines  $\frac{\sin A}{a} = \frac{\sin B}{b}$  where  $a$  is the side length opposite angle  $A$ , etc.

Law of Cosines  $c^2 = a^2 + b^2 - 2ab \cdot \cos C$  where  $c$  is the side length opposite angle  $C$

Law of Cosines  $c^2 = a^2 + b^2 - 2ab \cdot \cos C$

where  $c$  is the side length opposite angle  $C$

④

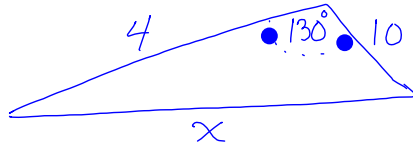


$$c^2 = 17^2 + 20^2 - 2(17)(20) \cdot \cos(115^\circ)$$

$$c^2 = 976.38 \dots$$

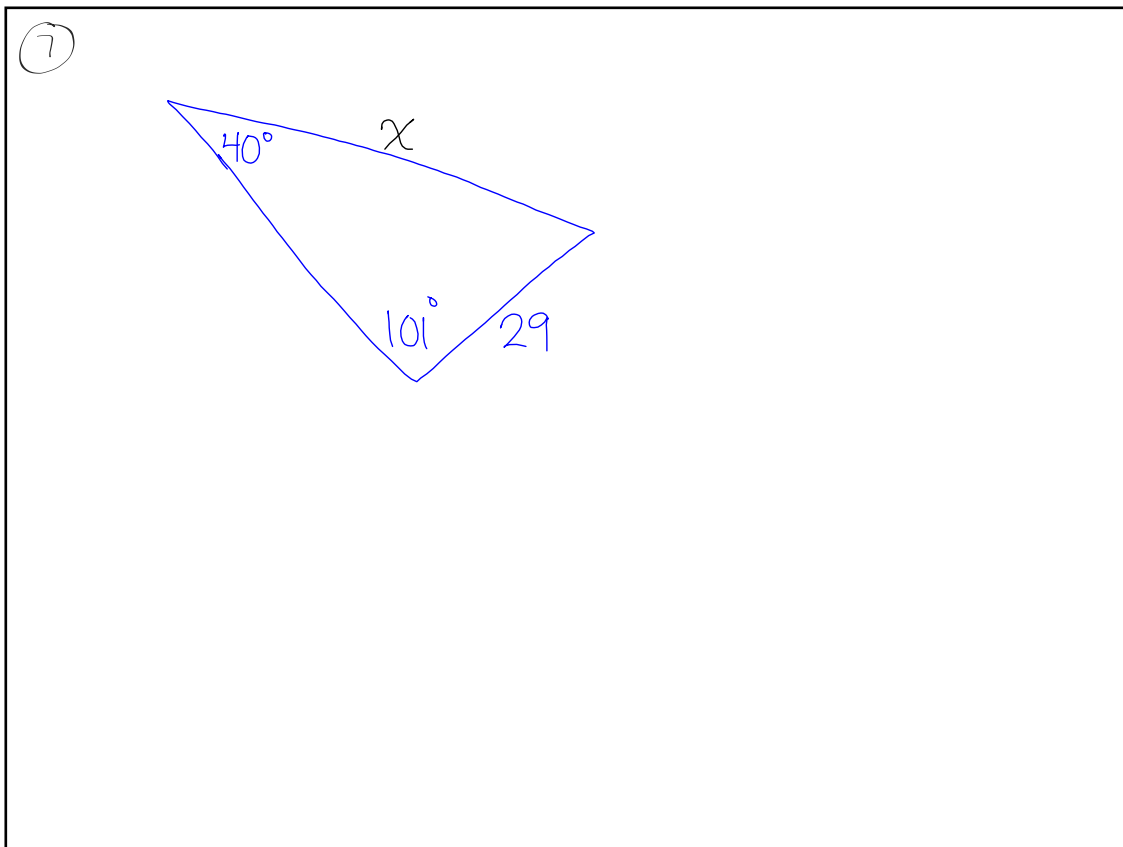
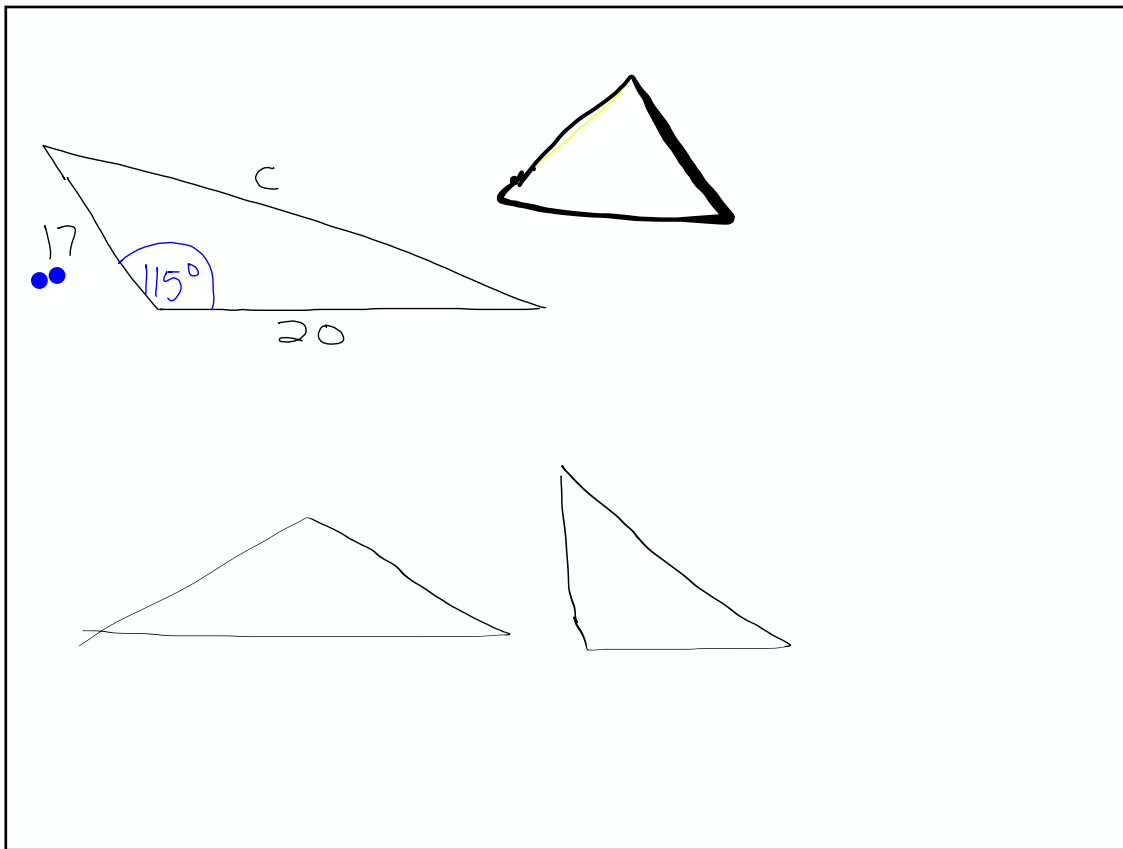
$$c = 31.25$$

⑥

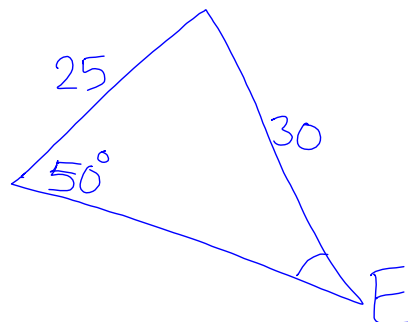
Try  
it!

Notice the incoming  
known information  
is in a SAS format

MORE Later on  
this topic



⑧ find  $m\angle E$



Brain Break

front

LCQ

Learning Check Quiz

10%

drop lowest  $\frac{1}{3}$

Back  
side

Non-graded  
Pre-check  
for a chapter 2  
skill

get some free  
points on the  
LCQ if  
you do your best

TRIANGLE  
Assignment

show steps  
as in class

See your  
LCQ 2