HW Help

1. Pull out your Alg/Geometry Reference Sheet

2. Then pick up the Warm Up

Missed an LCQ ?

① Fill in the boxes

$1^2 = \boxed{}$ $2^2 = \boxed{}$ $3^2 = \boxed{}$ $4^2 = \boxed{}$

$5^2 = \boxed{}$ $6^2 = \boxed{}$ $7^2 = \boxed{}$ $8^2 = \boxed{}$

$9^2 = \boxed{}$ $10^2 = \boxed{}$ $11^2 = \boxed{}$ $12^2 = \boxed{}$

$13^2 = \boxed{}$ $14^2 = \boxed{}$ $15^2 = \boxed{}$

② All the numbers inside the boxes above are examples of numbers called ________ ________.

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① Fill in the boxes

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

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

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

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

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.

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

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

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

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

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

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

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

$x^2 - 225 = (x+15)(x-15)$

$a^2 - b^2 = (\quad)(\quad)$

(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: $n^2 - 36 = 0$

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

$n = \pm 6$

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

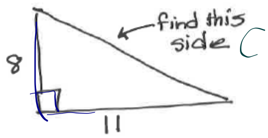
ZPP

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

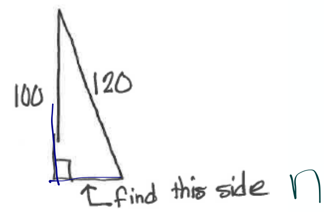
$n=-6 \quad n=6$

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

⑥ Right Triangle Geometry baby!



⑦



$c^2 = 8^2 + 11^2$

$c^2 = 185$

$c = \sqrt{185}$

$c \approx 13.6$

$100^2 + n^2 = 120^2$

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

$n = \sqrt{4400}$

$\approx \underline{\underline{66.3}}$

Questions on HW

$\boxed{47}$

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

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

ⓑ $f\left(\frac{1}{10}\right) =$

ⓒ $f(.01) = \dfrac{1}{.01} =$

ⓓ $f(.007) = \dfrac{1}{.007} \approx$

$\boxed{48_a}$ $x^2 - 8x + 15 = 0$

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

x^2	
	15

$-8x$

$1x \quad 15x$

$-1x \quad -15x$

$-3x \quad -5x$

$3x \quad 5x$

$\boxed{48b}$ $2x^2 - 5x - 6 = 0$

can't be factored

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

$2x^2$	
	-6

$-12x^2$

$-5x$

$-1x \quad 12x$

$1x \quad -12x$

$-2x \quad 6x$

$2x \quad -6x$

$-3x \quad 4x$

$3x \quad -4x$

Can't be factored

$\boxed{48b}$ $2x^2 - 5x - 6 = 0$

can't be factored

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

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

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

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

$\boxed{49}$ $(-5,0)$ $(0,3)$

distance formula

slope

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

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

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

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

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

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

$\boxed{51}$

$$4.1x=9.5x+23.7$$

$$-4.1x=-4.1x$$

$$5.4x=23.7$$

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

$$x=4.39$$

error is ?

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

52b $\frac{1}{5}x - 2 = \frac{13}{25} - 0.7x$

Random HW Check

Turn in the assignment that was due today. Be sure your name is on it.

I'll give it back tomorrow or the next day so you can include it with your HW packet due on test day.

Agenda : Revisit Trigonometry from Geometry

NOTES

Right Triangles
- Pythagorean Theorem
- Soh Cah Toa

All triangles
- Law of Sines
- Law of Cosines

Right Triangles | Any Triangle

Right Triangles Any Triangle

about sides only sides + angles

Right Triangles Any Triangle

about sides only sides + angles

↓ ↓

Pythag. Theorem Soh Cah Toa (Trig)

$leg^2 + leg^2 = hypot^2$

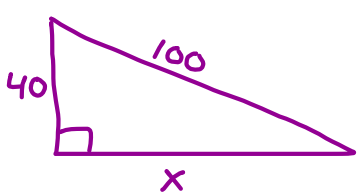
Right Triangles

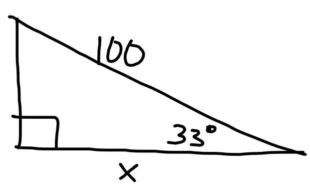
- about sides only → Pythag. Theorem
  - $leg^2 + leg^2 = hypot^2$
- sides + angles → Soh Cah Toa (Trig)

Any Triangle

- given ASA, AAS, SSA → Law of Sines
- given SAS, SSS → Law of Cosines

What is the main difference ?



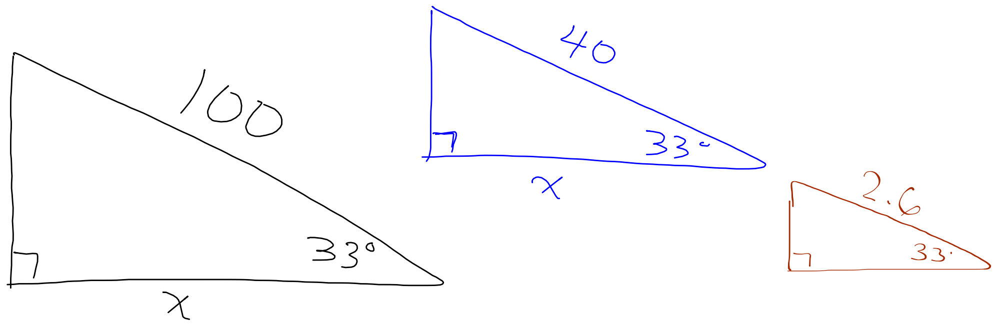


Could use Pythag. Theorem

Can't

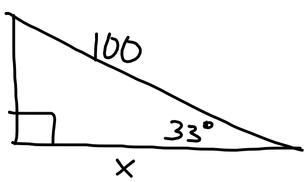
but the ratios of sides in all 33° right triangles are the same!

From Geometry: Triangles that are similar have ratios of sides that are identical.



For example, all <u>right</u> triangles in the world that have a 33 degree angle have the same exact ratio of sides.

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



Sine
opposite
hyp.

Cosine
adjacent
hypot

Tangent
opposite
adjacent

$$\boxed{\cos(33^\circ) = \frac{x}{100}}$$

$$x = 100 \cdot \cos(33^\circ)$$

$$\approx 83.87$$

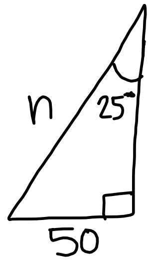
a

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

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

$$\cos(\text{angle}) = \frac{\bullet}{\bullet}$$

1

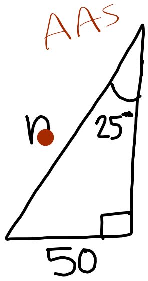


$$\sin(25^\circ) = \frac{50}{n}$$

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

$$n \approx 118.31$$

AAS



but this time with Law of Sines

$$\frac{\sin(25^\circ)}{50} = \frac{\sin(90^\circ)}{n}$$

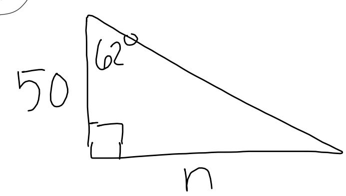
$$\frac{n}{50} = \frac{\sin(90)}{\sin(25^\circ)}$$

multiply by 50

$$n = \frac{50 \cdot \sin(90)}{\sin(25)} = 118.31$$

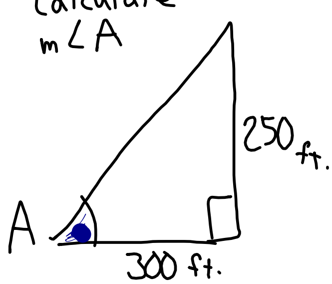
same!

(2)



(3)

Calculate $m\angle A$



~~Soh~~ ~~Cah~~ Toa

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

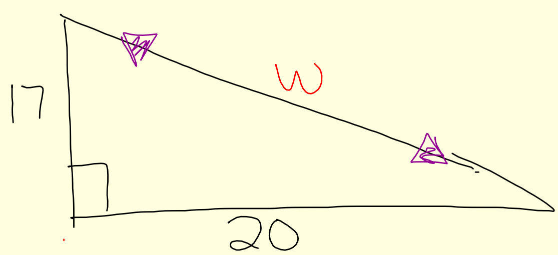
$$A = \tan^{-1}\left(\frac{250}{300}\right)$$

$$\approx \cancel{49.8}$$

$$39.81^\circ$$

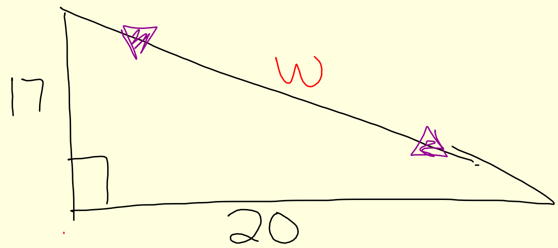
Right Triangles vs Non-Right Triangles

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



So what would happen if we stretched the hypotenuse?

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

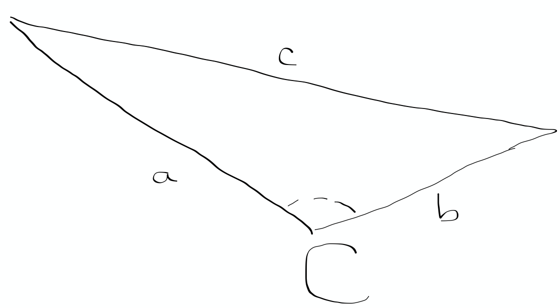


$$c^2 = a^2 + b^2 - \text{Adjustment}$$

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 side

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

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

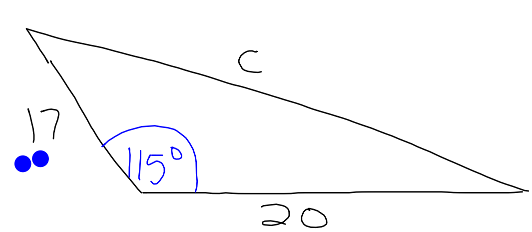
Law of Cosines $c^2 = a^2 + b^2 - 2ab \cdot \cos C$ where c is the side length opposite an

your reference sheet

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

where c is the side length opposite angle C

4

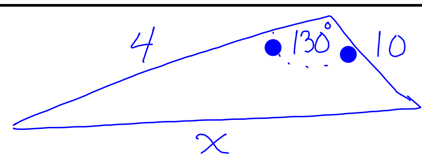


$$c^2 = 17^2 + 20^2 - 2(17)(20) \cdot \cos(115°)$$

$$c^2 = 976.38\ldots$$

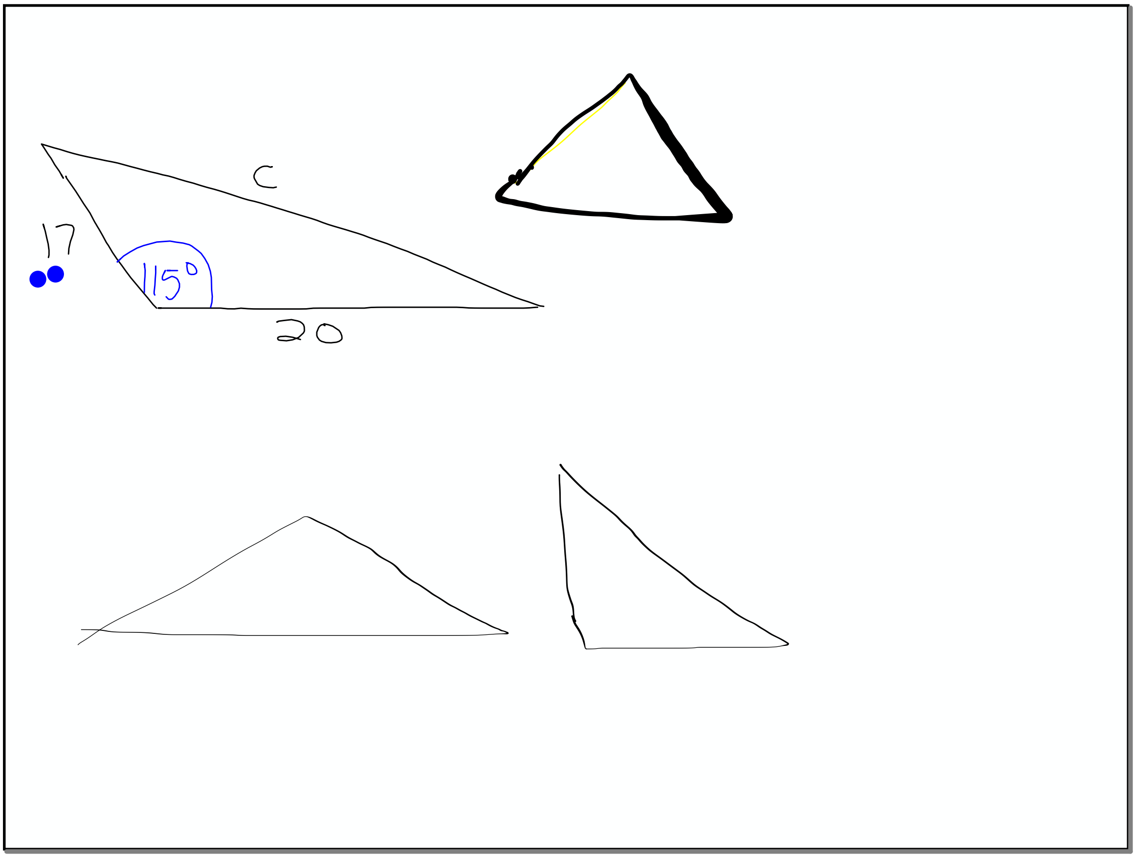
$$c = 31.25$$ feet

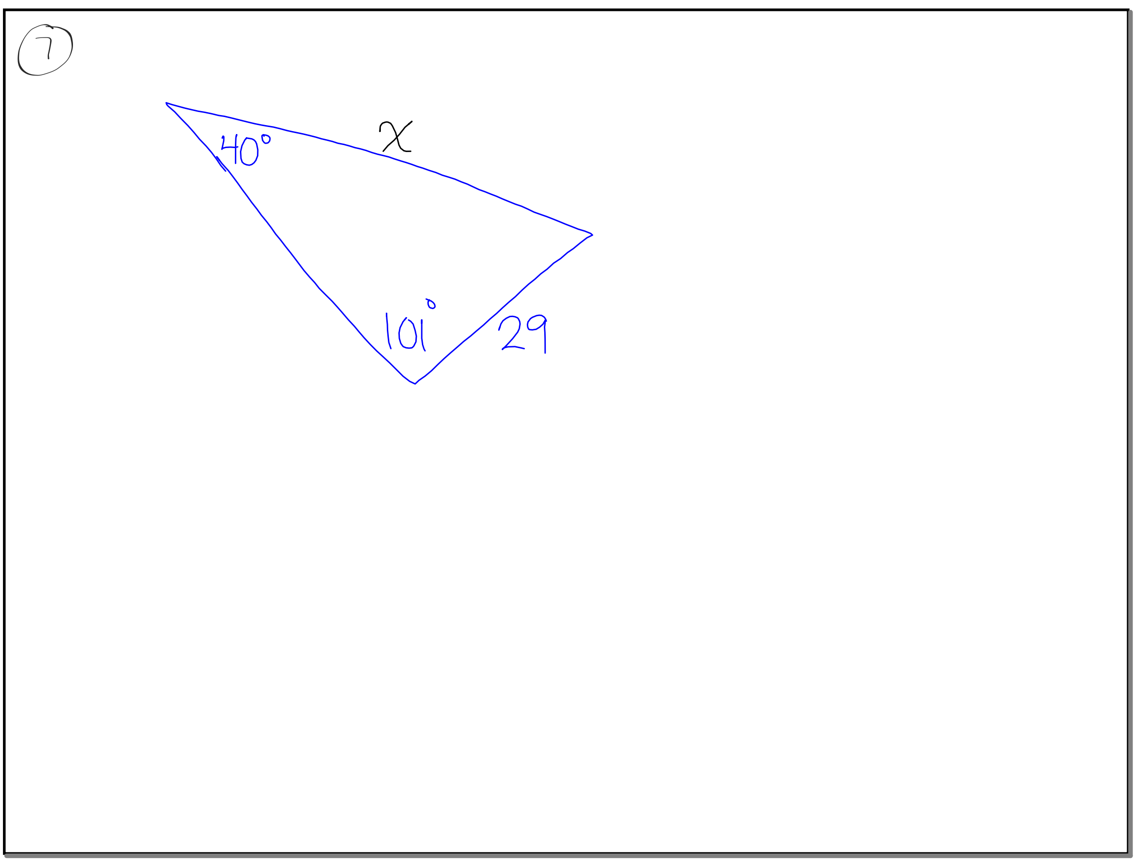
6 Try it



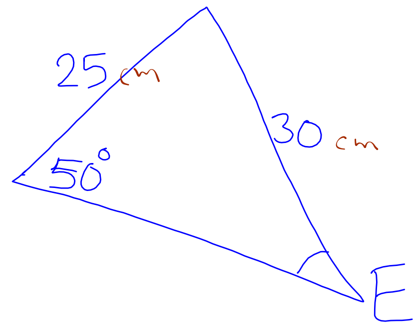
Notice the incoming Known information is in a SAS format

MORE Later on this topic


c
17
115°
20


7
x
40°
101°
29

(8) find m∠E



front

LCQ

Learning Check Quiz

10%

drop lowest 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

Prelearning Check
for Ch 2

TRIANGLE
Assignment

show steps
as in class

See your
LCQ 2