

Welcome Back MYP Math 9!

Reflect on last night's exercises.

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>11/20</u> Topic: <u>13C Solving for sides</u>	0 1 2	
Tuesday Date: <u>11/21</u> Topic: <u>13C Review - Solving for sides</u>	0 1 2	
Wednesday Date: _____ Topic: _____	0 1 2	
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Class Plan:

1. Warm-up, then Video
2. Whole group:
Solving for angles, 2 examples.
3. Real-life example
4. Practice

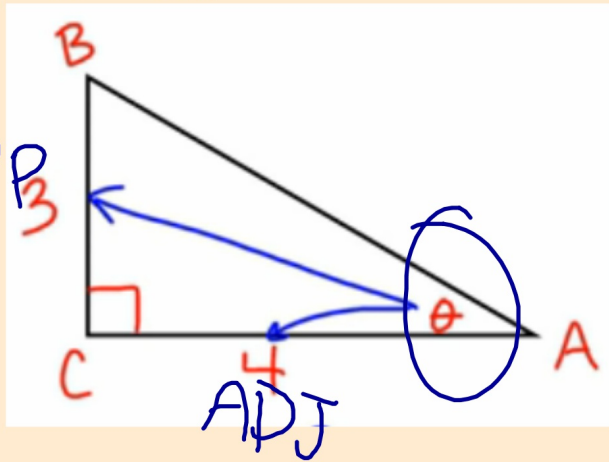
D**FINDING ANGLES**

Warm-up: What relationship is shown in the triangle?
How can we find θ ?

Tangent

OPP
3

$$\tan \theta = \frac{3}{4}$$
$$= .75$$

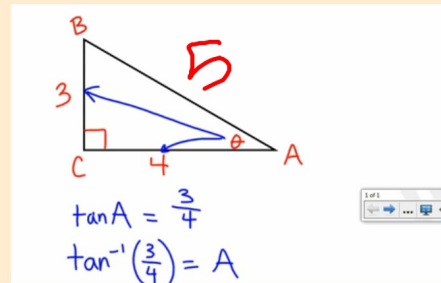


D**FINDING ANGLES**

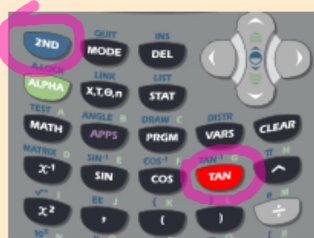
Example: Pause at 1:54

<https://www.youtube.com/watch?v=A3645vddzHE>

Use your
calculator to find
the measure of
angle A.

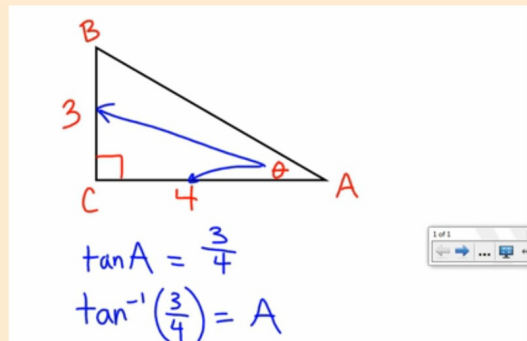


Use your calculator to find the measure of angle A.



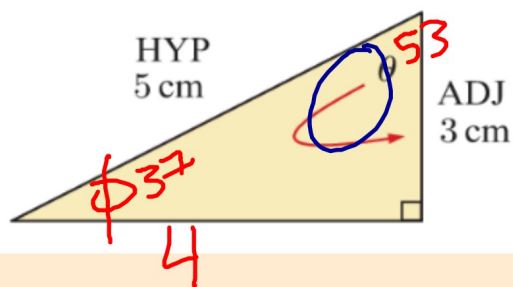
2nd, Tan, 3/4, enter

```
tan⁻¹(3/4  
36.86989765
```



D**FINDING ANGLES**

How do I solve for an angle measure?

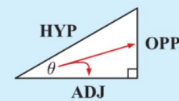
Example:

~~$$\cos(\theta) = \left(\frac{3}{5}\right)^{\cos^{-1}}$$~~

$$\theta = \cos^{-1}\left(\frac{3}{5}\right) \approx 53.13^\circ$$

In any right angled triangle with one angle θ , we have:

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}, \quad \cos \theta = \frac{\text{ADJ}}{\text{HYP}}, \quad \tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$



D**FINDING ANGLES**

Steps to follow...

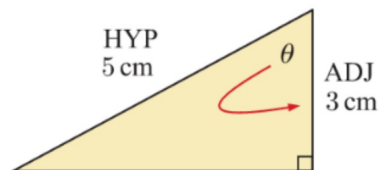
1. Label the given sides (adj, opp, hyp)
2. Determine what trig ratio to use
3. Solve using inverse trig operations

Example:

To find θ , we need an angle whose cosine is $\frac{3}{5}$.

We say that θ is the **inverse cosine** of $\frac{3}{5}$, and write

$$\theta = \cos^{-1}\left(\frac{3}{5}\right).$$



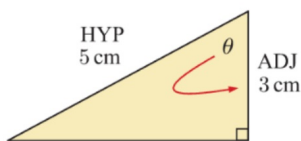
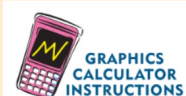
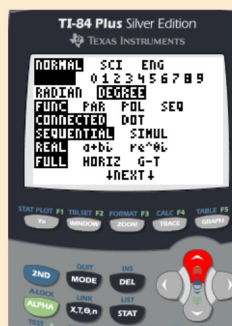
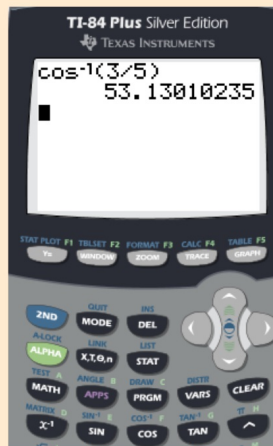
D

FINDING ANGLES

1. MODE: DEGREE

Example:

2. 2ND - COS

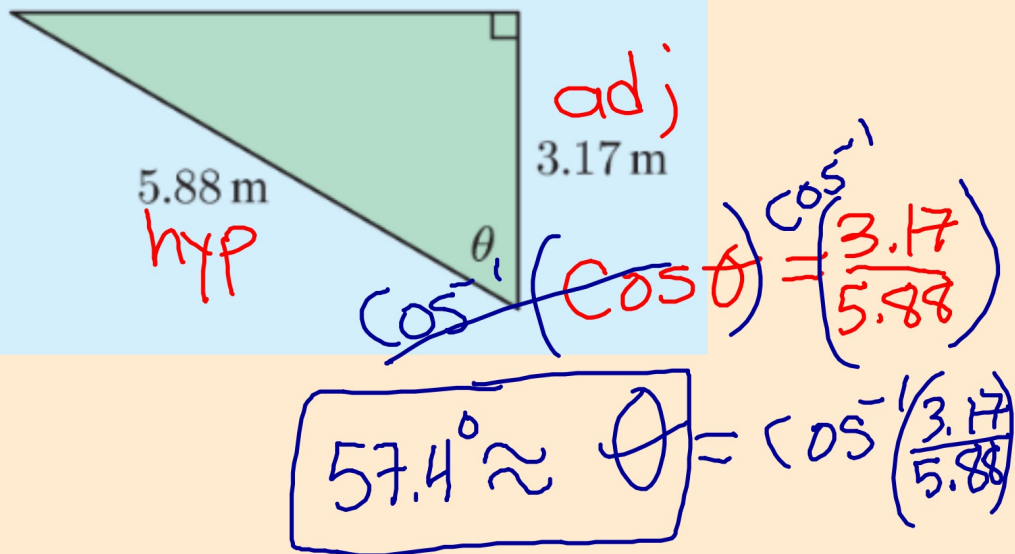


For the right angled triangle with hypotenuse 5 cm and adjacent side 3 cm, $\theta \approx 53.1^\circ$.

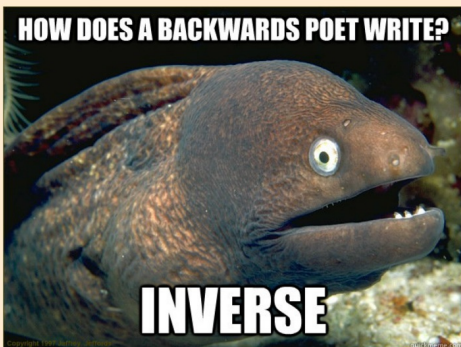
We define **inverse sine** and **inverse tangent** in a similar way.

Example: Draw triangle in notebook.

Find, to 1 decimal place, the measure of the angle marked θ .

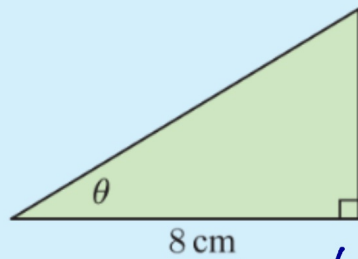


Joke break!



Example: Draw triangle in notebook.

Find, to 1 decimal place, the measure of the angle marked θ .



opp $\tan \theta = \frac{5}{8}$

adj $\tan^{-1}(\tan \theta) = \tan^{-1}\left(\frac{5}{8}\right)$

$$\theta = \tan^{-1}\left(\frac{5}{8}\right)$$

$$\theta \approx 32^\circ$$

Example: Real Life Application

A 13 meter flagpole casts a 9 meter shadow.
Find the angle of elevation of the sun.

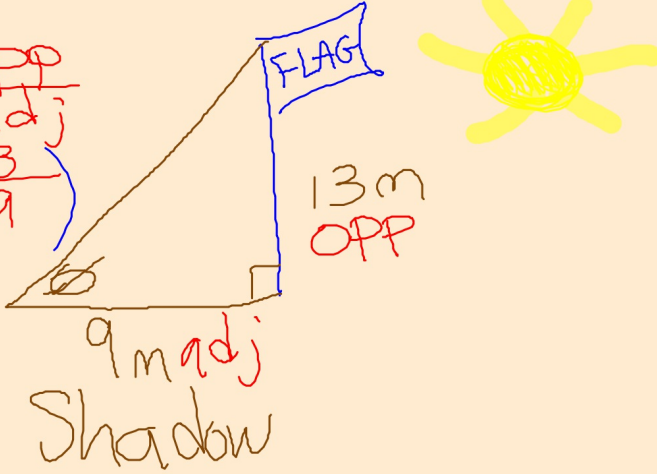
****Draw picture to illustrate situation before solving****

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan^{-1}(\tan \theta) = \tan^{-1}\left(\frac{13}{9}\right)$$

$$\theta = \tan^{-1}\left(\frac{13}{9}\right)$$

$$\theta \approx 55^\circ$$

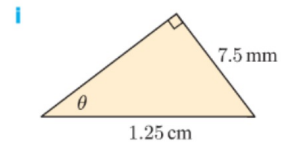
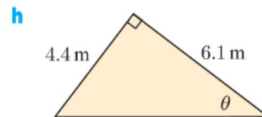
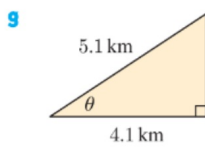
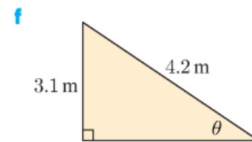
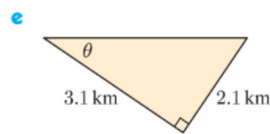
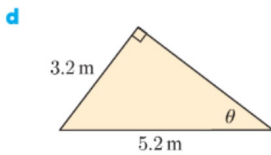
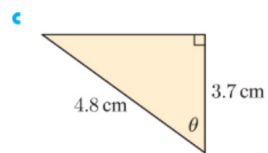
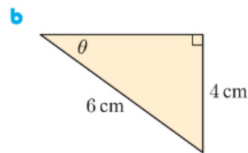
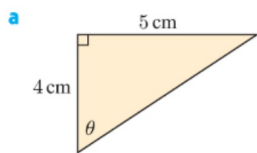


Classwork:

1) ~~Do: a, c, d, g, h~~

~~EXERCISE 13D~~
Textbook: 13D (page 259) #1, 2, 3

1 Find, to 1 decimal place, the measure of the angle marked θ .



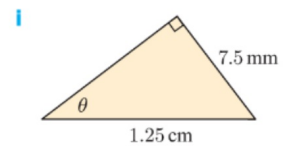
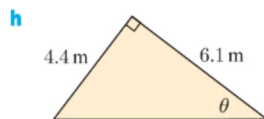
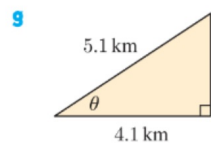
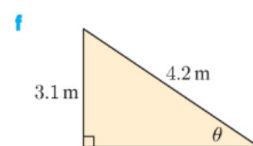
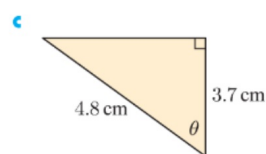
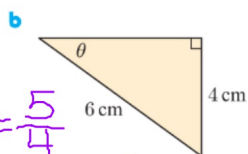
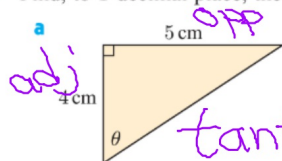
Done:? finish, help others

Exercises....

Textbook:13D (page 259) #1,2, 3

EXERCISE 13D

- 1 Find, to 1 decimal place, the measure of the angle marked θ .

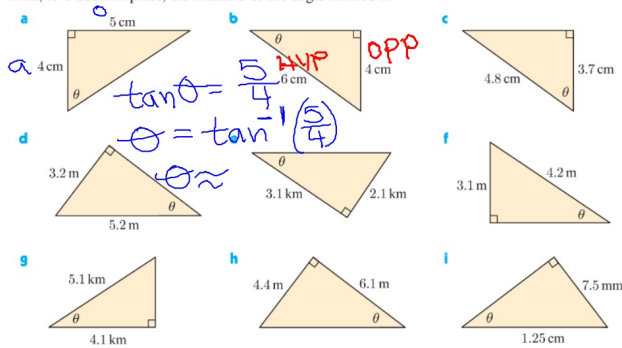


Exercises....

Textbook: 13D (page 259) #1, 2, 3

EXERCISE 13D

1 Find, to 1 decimal place, the measure of the angle marked θ .



$$\theta \approx 41.8^\circ$$

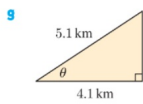
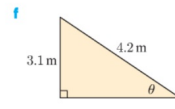
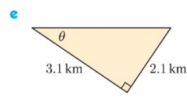
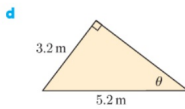
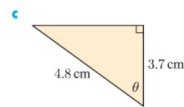
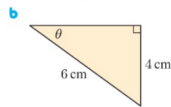
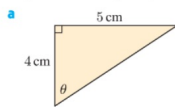
$$\textcircled{b} \sin \theta = \frac{4}{6} \quad \theta = \sin^{-1}\left(\frac{4}{6}\right)$$

Exercises....

Textbook: 13D (page 259) #1, 2, 3

EXERCISE 13D

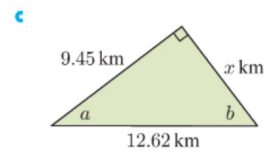
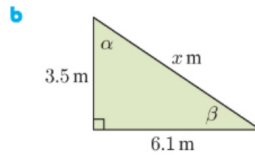
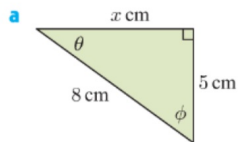
1 Find, to 1 decimal place, the measure of the angle marked θ .



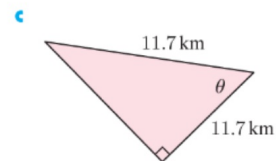
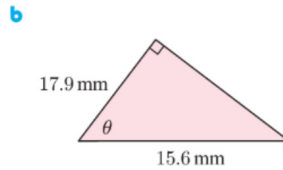
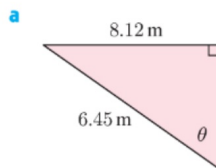
$$10\text{mm} = 1\text{cm}$$
$$7.5\text{mm} = .75\text{cm}$$

Textbook: 13D (page 259) #1, 2, 3

- 2 Find, to 1 decimal place, all unknown sides and angles in the following triangles. Check your answers for x using Pythagoras' theorem.



- 3 Find θ in the following using trigonometry. What conclusions can you draw?



Textbook:13D (page 259) #1,2, 3

SOLUTIONS

EXERCISE 13D

- 1** **a** $\theta \approx 51.3^\circ$ **b** $\theta \approx 41.8^\circ$ **c** $\theta \approx 39.6^\circ$
d $\theta \approx 38.0^\circ$ **e** $\theta \approx 34.1^\circ$ **f** $\theta \approx 47.6^\circ$
g $\theta \approx 36.5^\circ$ **h** $\theta \approx 35.8^\circ$ **i** $\theta \approx 36.9^\circ$
- 2** **a** $\theta \approx 38.7^\circ$, $\phi \approx 51.3^\circ$, $x \approx 6.2$
b $\alpha \approx 60.2^\circ$, $\beta \approx 29.8^\circ$, $x \approx 7.0$
c $a \approx 41.5^\circ$, $b \approx 48.5^\circ$, $x \approx 8.4$

- 3** These three triangles do not exist. The hypotenuse must be longer than the other sides.