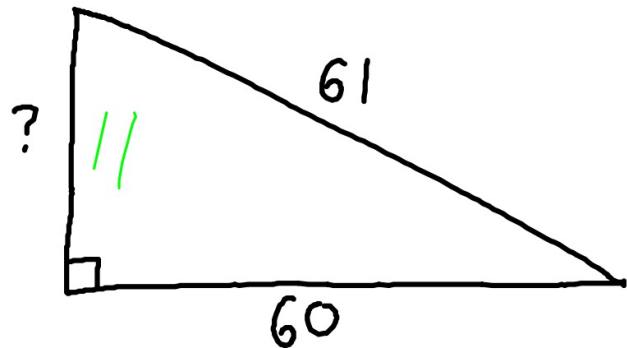


Warm Up



What is the length of the missing side of this right triangle?



Objective: SWBAT solve problems in right triangle trigonometry

Agenda:

- Warm Up
- Notes/Refresh from Math 2
- Practice
- Reflection

HW: 14-3G
5, 8-10, 17

Notes: Trig Ratios

$$\sin(A) = \frac{a}{c}$$

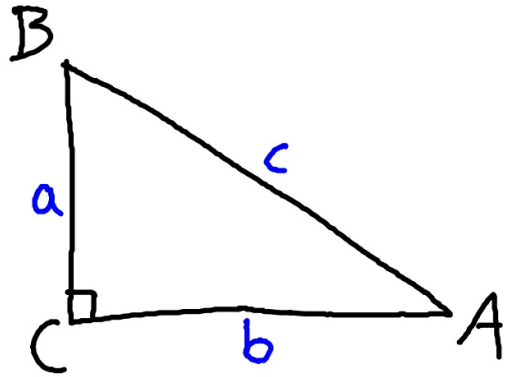
$$\cos(A) = \frac{b}{c}$$

$$\tan(A) = \frac{a}{b}$$

$$\sin(B) = \frac{b}{c}$$

$$\cos(B) = \frac{a}{c}$$

$$\tan(B) = \frac{b}{a}$$



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

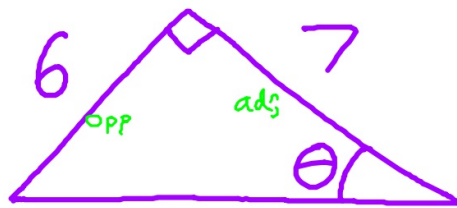
a.k.a.
 $\arcsin\left(\frac{a}{c}\right)$,
etc.

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

etc.

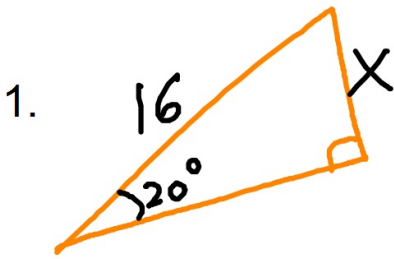
Notes: Finding Missing Parts

1. draw a picture
2. identify the trig ratio you need
3. plug in & work it out



$$\tan \theta = \frac{6}{7}$$
$$\theta = \tan^{-1}\left(\frac{6}{7}\right) \approx 40.6^\circ$$

Examples

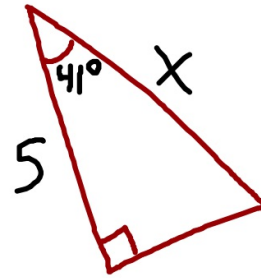


$$16 \cdot \sin(20^\circ) = \frac{X}{16} \cdot 16$$

$$16 \cdot \sin(20^\circ) = X$$

$$5.47 = X$$

2.



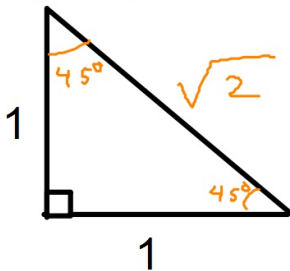
$$\cos 41 = \frac{a}{h} = \frac{5}{X}$$

$$\cdot X \frac{\cos 41}{\cos 41} = \frac{5}{\cos 41}$$

$$X \approx 6.62$$

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

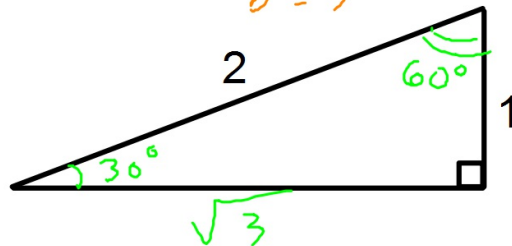
$$1 + 1 = c^2$$



Special Right Triangles

$$1^2 + b^2 = 2^2$$

$$b^2 = 3$$



What is the missing side? What are the angles?

$$\cos \theta = \frac{1}{2}$$

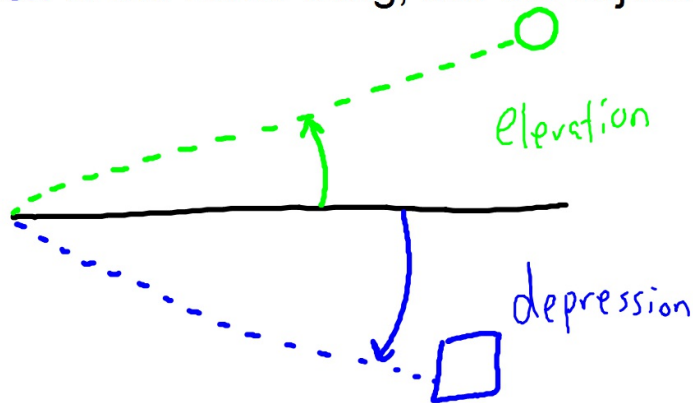
$$\theta = \cos^{-1}\left(\frac{1}{2}\right)$$

$$= 60^\circ$$

Notes: Angle of Elevation/Depression

An *angle of elevation* is an acute angle that extends from a horizontal line to a diagonal that runs from the viewer to an object above the viewer.

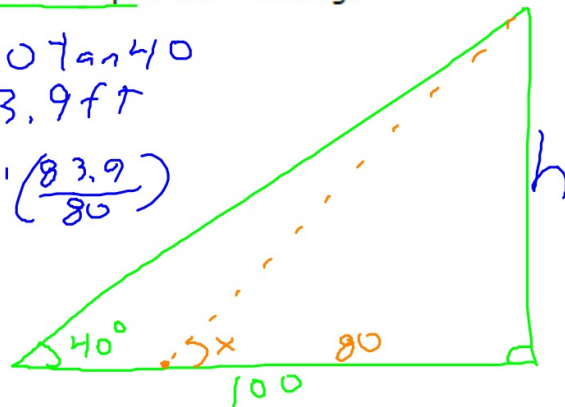
An *angle of depression* is the same thing, but the object is below the viewer



From a point 100 feet from the base of a building, Angie looks up at a 40° angle to the top of a building. She walks 20 feet closer to the building. At **approximately** what angle must Angie now look up to see the top of the building?

$$\tan 40 = \frac{h}{100} \rightarrow h = 100 \tan 40 \approx 83.9 \text{ ft}$$

$$\tan x = \frac{83.9}{80} \rightarrow x = \tan^{-1}\left(\frac{83.9}{80}\right) \approx 46^\circ$$



Practice

Precalculus pg. 227 19-26, 31-38

Reflection

What is the difference between angle of elevation and angle of depression?