Given the lengths of sides, we can use "trig" functions to find missing _angles_ by using their inverses:
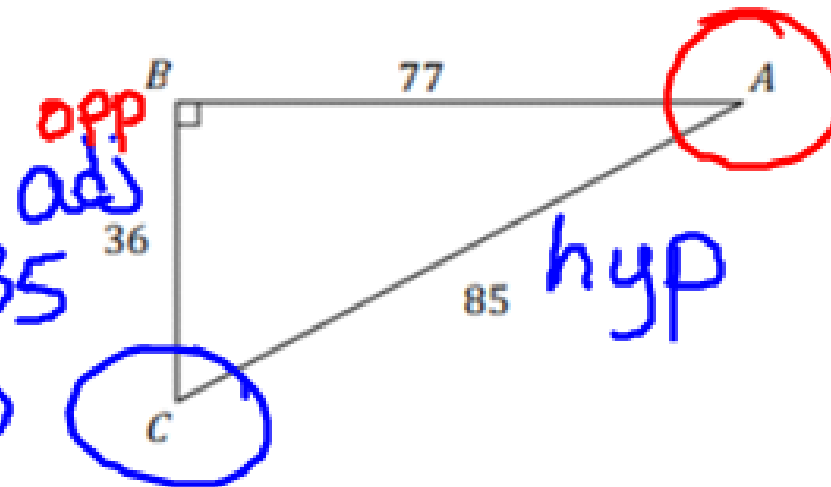
$$\sin^{-1}, \cos^{-1}, \tan^{-1}$$

**Let's Practice!**

1. Consider the triangle below.

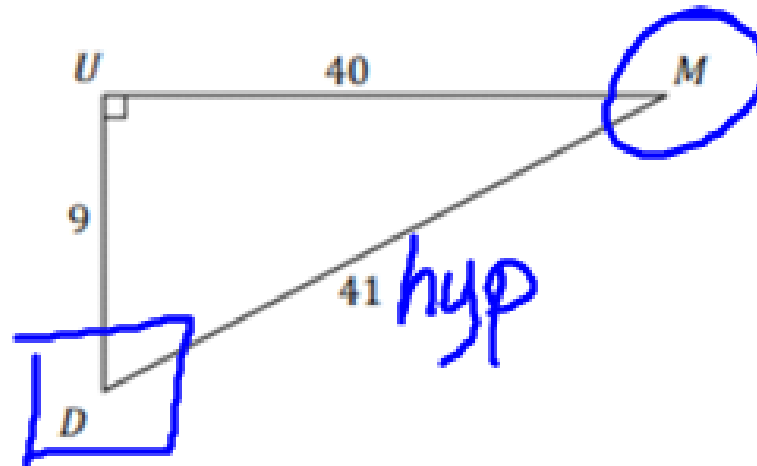$$\cos C = \frac{36}{85}$$

$$= 0.4235$$

$$m\angle C = 64.9°$$

opp
adj

B — 77 — A

36

85 hyp

C

$$\sin A = \frac{36}{85}$$

$$= .4235$$

$$m\angle A = 25.1°$$

Find cosC, sinA, m∠A and m∠C for the triangle.

2. Consider the triangle below.



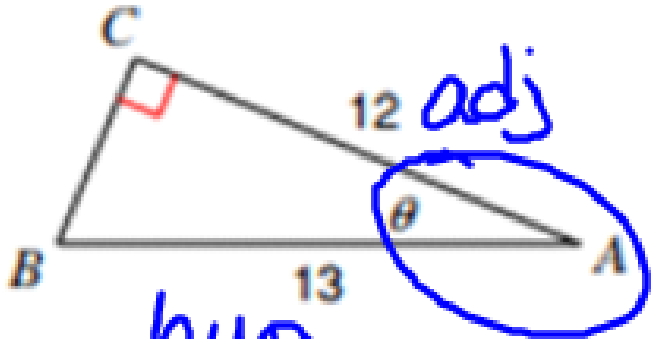Find tanM, cosD, m∠D and sinM for the triangle.

$$\tan M = \frac{9}{40}$$

$$= .225$$

$$\cos D = \frac{9}{41}$$

$$= .2195$$

$$\angle D = 77.3°$$

$$\sin M =$$

$$= \frac{9}{41}$$

$$= .2195$$

C

12 adj

B ____ 13 ____ A

θ

hyp

$\cos\theta = \dfrac{12}{13}$

$= .9231$

$\theta = 22.6°$

13

4

A ____ θ ____ B

C

$\tan\theta = \dfrac{4}{13}$

$\theta = 17.1°$

B

θ

3 | 45

C ____ 3 ____ A

45
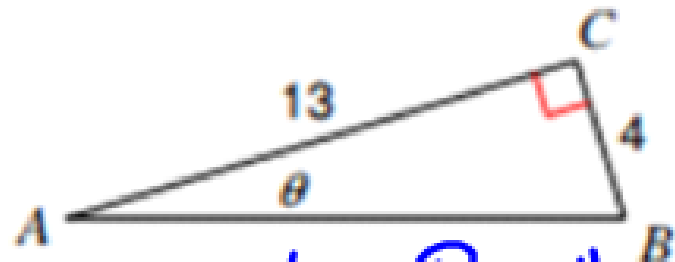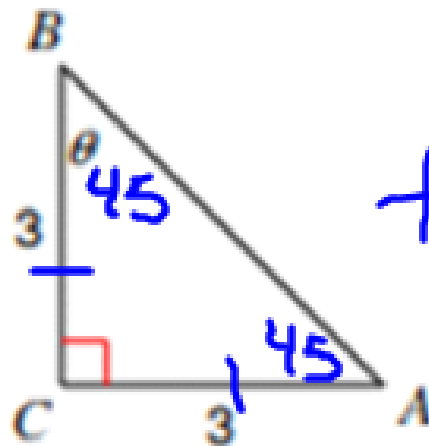
$\tan\theta = \dfrac{3}{3}$

$\theta = 45°$

The picture below shows the path that Puppy Liz is running. The electrical post is 40 feet tall. Puppy Liz usually starts at the bench post and runs until she gets to the fire hydrant, rests, and then she runs back to the bench. How far does Puppy Liz run to get to the fire hydrant?

$$\tan 57 = \frac{y}{40}$$

$$40 \tan 57 = y$$

$$40 * 57 \tan =$$

$$41.5945$$

23°

34°

57°

40 ft

x

y

Puppy Liz runs [                ] feet.