Mathematics 11C

1.1 – Primary Trigonometric Ratios

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Trigonometry is the study of the relationship between angles and sides of a triangle.

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There are 3 primary ratios: → fraction → decimals

Sine Cosine Tangent

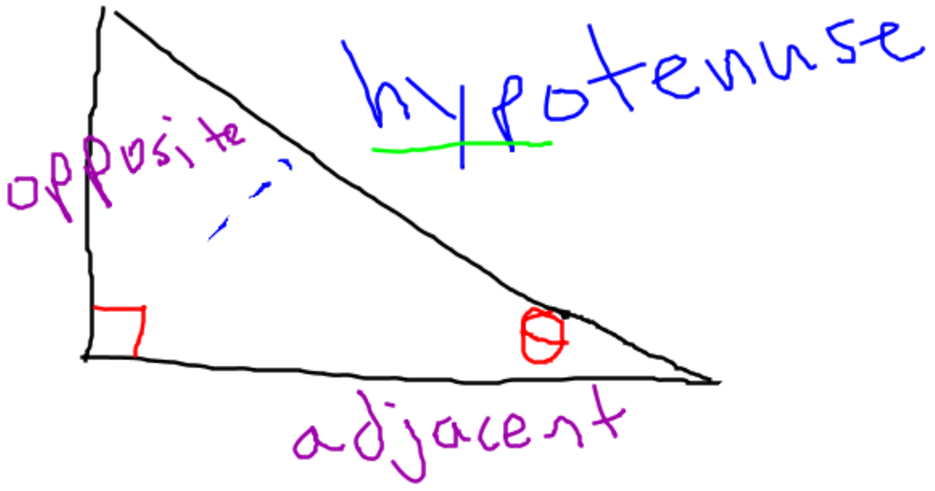
On the calculator:

$\sin(\text{Angle}) = \text{ratio}$

$\sin 32^\circ = 0.5299$

$\sin^{-1}(\text{ratio}) = \text{angle}$

$\sin^{-1}(0.5299) = 32^\circ$



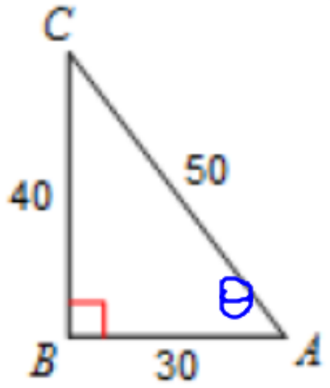
θ = theta

$$\sin\theta = \frac{opp}{hyp} \qquad \cos\theta = \frac{adj}{hyp} \qquad \tan\theta = \frac{opp}{adj}$$

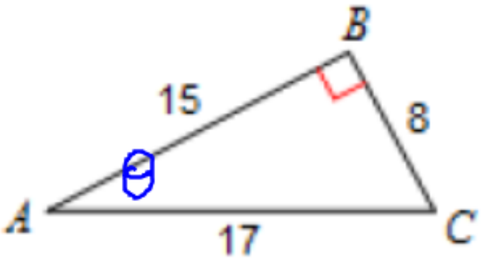
sohcahtoa

Find the value of each trigonometric ratio to the nearest ten-thousandth.

1) $\cos A$ $= \frac{30}{50} = \frac{3}{5} = 0.6$

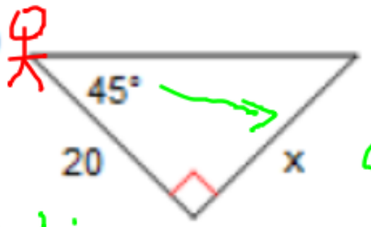


2) $\tan A$



$= \frac{8}{15} = 0.5333$

Find the missing side. Round to the nearest tenth.

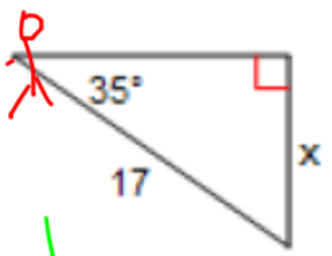
3) 

opp

adj

$20\tan 45 = \frac{x}{20}(20)$

$20 = x$

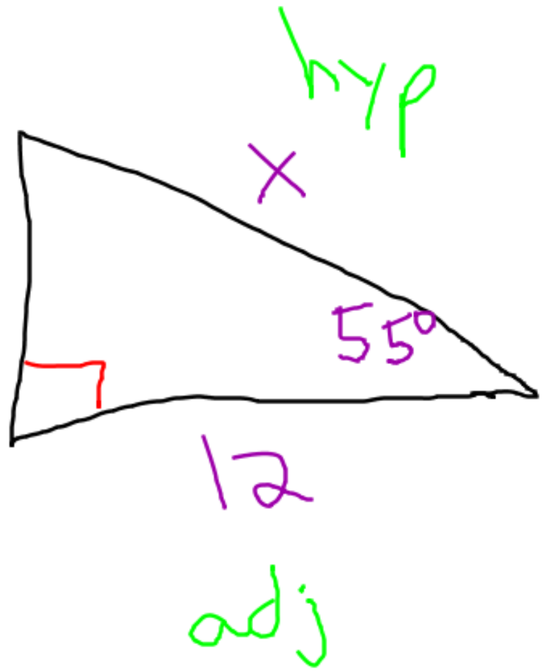
4) 

opp

hyp

$(17)\sin 35 = \frac{x}{17}(17)$

$9.8 = x$



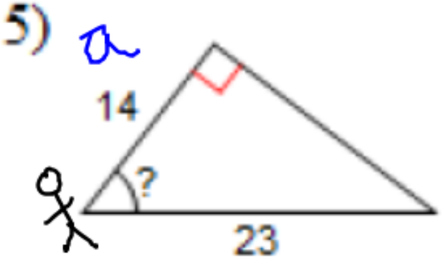
$$\cos 55 = \frac{12}{x}$$

$$x = \frac{12}{\cos 55}$$

$$x = 20.9$$

Find the measure of the indicated angle to the nearest degree.

5)

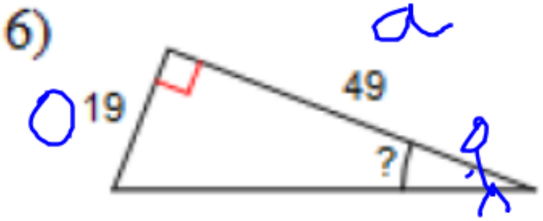


$$\cos\theta = \frac{14}{23}$$

$$\theta = \cos^{-1}\left(\frac{14}{23}\right)$$

$$\theta = 53^{\circ}$$

6)

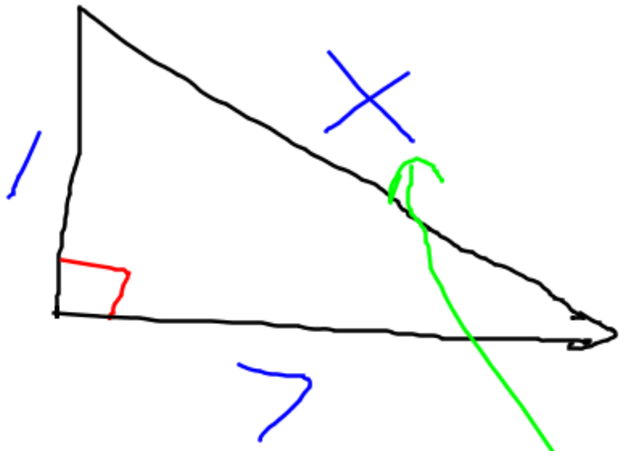


$$\tan\theta = \frac{19}{49}$$

$$\theta = \tan^{-1}\left(\frac{19}{49}\right)$$

$$\theta = 21^{\circ}$$

Don't forget Pythagorean Theorem!!



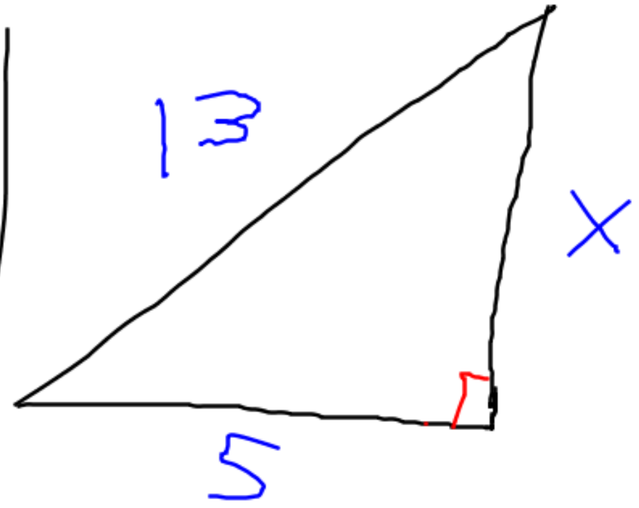
$a^2 + b^2 = c^2$

$1^2 + 7^2 = x^2$

$1 + 49 = x^2$

$\sqrt{50} = \sqrt{x^2}$

$7.1 = x$



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

$x^2 + 5^2 = 13^2$

$x^2 + 25 = 169$ -25

$\sqrt{x^2} = \sqrt{144}$

$x = 12$