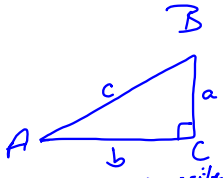
6.7 Sine and Cosine Ratios

Sine and Cosine refer to ratios of sides in a right triangle

The ratio of sides determines the value (measure) of an angle



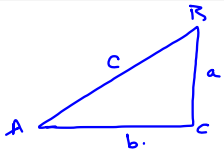
Sin

Cos

- hypotenuse is the side opposite the right angle
- opposite side is the side it's not touching
- adjacent side is the side it's touching that is not the hypotenuse

$\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$

$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$

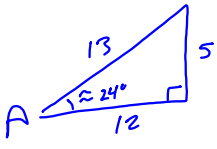


$\sin A = \frac{a}{c}$

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

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

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



$\sin A = \frac{5}{13} = 0.4167$

$\cos A = \frac{12}{13} = 0.9231$

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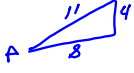
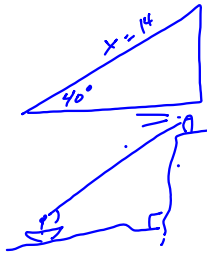
Table of ratios

Find measure of angle given sides



$\cos A = \frac{8}{11} = 0.7273$

$\angle A \approx 43°$

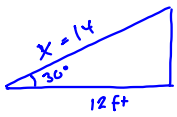


$\sin 40° = \frac{9}{x}$

$x(.6428) = \frac{9}{x})x$

$\frac{.6428x}{.6428} = \frac{9}{.6428}$

$x = 14$

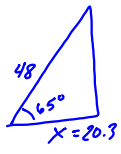


$\cos 30 = \frac{12}{x}$

$(0.8660 = \frac{12}{x})x$

$\frac{0.8660x}{0.8660} = \frac{12}{0.8660}$

$x = 14$



$\cos 65 = \frac{x}{48}$

$48(\cos 65) = x$

$48(.4226) = x$

$20.3 = x$