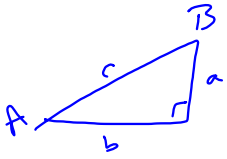
9.5 Trigonometric Ratios

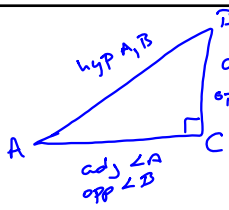


3 basic ratios
- sine (sin)
- cosine (cos)
- tangent (tan)

opposite – leg that angle is not touching

adjacent – leg that angle is touching

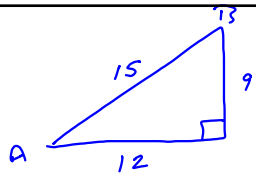
hypotenuse – side opposite the right angle



$\sin = \frac{\text{opposite}}{\text{Hypotenuse}}$

$\cos = \frac{\text{adjacent}}{\text{Hypotenuse}}$

$\tan = \frac{\text{opposite}}{\text{adjacent}}$



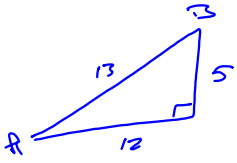
Fraction

$\sin A = \frac{9}{15} = \frac{3}{5} = \cos B$

$\cos A = \frac{12}{15} = \frac{4}{5} = \sin B$

$\tan A = \frac{9}{12} = \frac{3}{4}$

$\tan B = \frac{12}{9} = \frac{4}{3}$



Decimal (4 places)

$\sin A = \frac{5}{13} = .3846$

$\cos B = 0.3846$

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

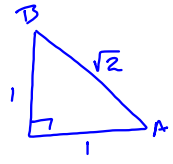
$\sin B = 0.9231$

$\tan A = \frac{5}{12} = .4167$

$\tan B = \frac{12}{5} = 2.4$

Each angle in a right triangle has a given ratio for sine, cosine and tangent

30, 45, 60

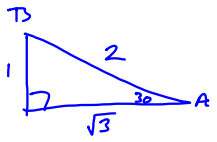


45, 45, 90

$\sin A = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\cos A = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\tan A = 1$



$\sin A = \frac{1}{2}$

$\cos A = \frac{\sqrt{3}}{2}$

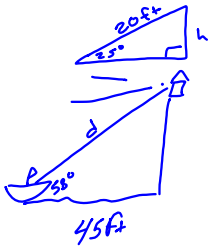
$\tan A = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\sin B = \frac{\sqrt{3}}{2}$

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

$\tan B = \frac{\sqrt{3}}{1}$

Finding distance



$(\sin 25° = \frac{h}{20})20$

$20(\sin 25°) = h$

$8.5\text{ft} = h$

$(\cos 58° = \frac{45}{d})d$

$\frac{d\cos 58°}{\cos 58°} = \frac{45}{\cos 58°}$

$d = 85\text{ft}$

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2 - 42 even