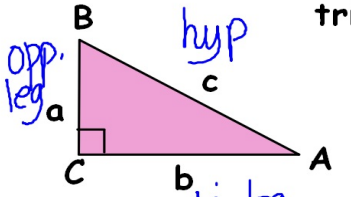
13-1/13-4 Right Triangle Trigonometry

trig. 12.0

$\frac{\sin A}{\cos A} = \tan A$



SOH CAH TOA

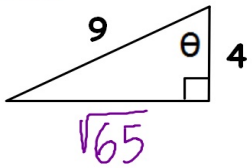
trigonometric ratios:

sine $\sin A = \frac{\text{opp leg}}{\text{hyp}} = \frac{a}{c}$

cosine $\cos A = \frac{\text{adj leg}}{\text{hyp}} = \frac{b}{c}$

tangent $\tan A = \frac{\text{opp}}{\text{adj}} = \frac{a}{b}$

ex. 1 Find each ratio: θ = theta



$\sin^2\theta + \cos^2\theta = 1$

$\frac{65}{81} + \frac{16}{81} = \frac{81}{81}$

$\sin\theta = \frac{\sqrt{65}}{9}$

$\cos\theta = \frac{4}{9}$

$\tan\theta = \frac{\sqrt{65}}{4}$

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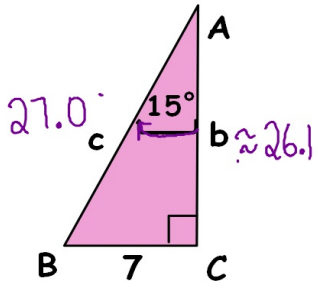
ex. 2 Solve $\triangle ABC$ $\angle C = 90°, \angle B = 75°$



$\frac{\tan 15°}{1} = \frac{7}{b}$

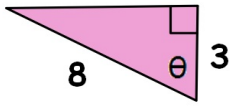
$b = \frac{7}{\tan 15°} \approx 26.1$

$\sin 15° = \frac{7}{c}$

$c = \frac{7}{\sin 15°}$

$c \approx 27.0$

ex. 3 Find the measure of θ.

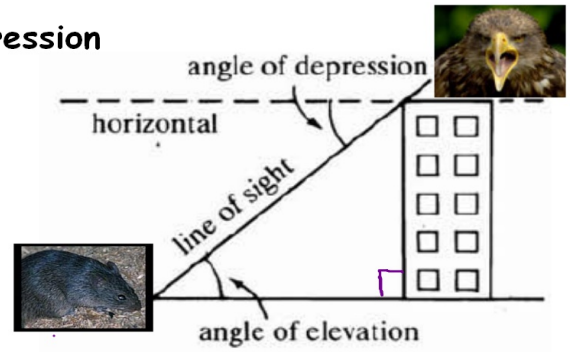


$\cos\theta = \frac{3}{8}$

$\theta = \cos^{-1}(3 \div 8)$ ANS

$\theta \approx 68.0°$

Angles of Elevation and Depression



ex. 4

You are standing at the end of the shadow of a giant Sequoia, 150 feet from its base. The angle of elevation of the sun is 63°. Find the height of the tree.

$\tan 63^\circ = \frac{t}{150}$

$\tan(63^\circ) * 150$

$t \approx 294.4$ ft