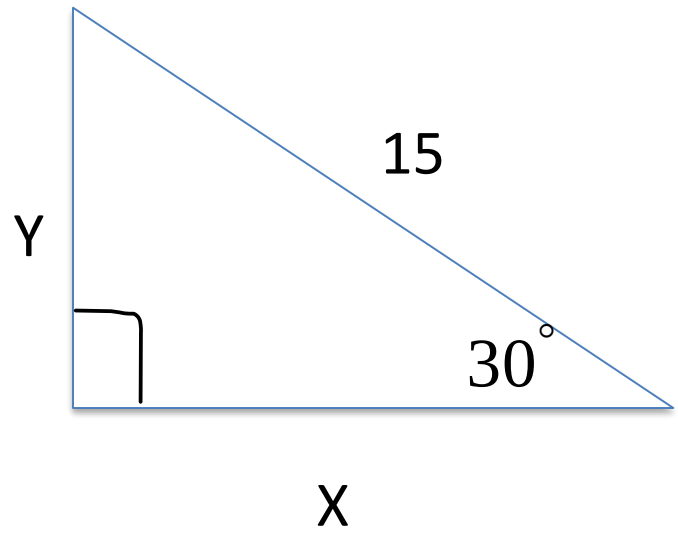
# Pre-Calculus
# Sec. 4.3
# Right Triangle Trig.

Ex.1) Find the value of $\cos\theta$ *and* $\tan\theta$, if θ is an angle in the 3rd quadrant, and $\sin\theta = -\frac{5}{8}$.

Ex.2) Find the exact value of the unknown variables in the right triangle.



# Cofunction Rules

Sine and Cosine
Secant and Cosecant
Tangent and Cotangent

} are Cofunctions

Ex. $\sin 30° = \frac{1}{2} = \cos 60°$

This occurs because the angles are complementary, in general, it can be shown from the right triangle definitions that ***cofunctions of complementary angles are equal***.

(The angles add up to 90° or $\pi/2$.)

# Cofunction Identities

$\sin(90° - \theta) = \cos\theta$ $\quad\quad$ $\cos(90° - \theta) = \sin\theta$

$\tan(90° - \theta) = \cot\theta$ $\quad\quad$ $\cot(90° - \theta) = \tan\theta$

$\sec(90° - \theta) = \csc\theta$ $\quad\quad$ $\csc(90° - \theta) = \sec\theta$

For radians $\pi/2$ will be substituted for 90°.

Note: These equations move from both left to right and right to left. Expand and Condense!!!!

Ex3) Find a cofunction with the same value as the given expression.

$a)\ sin35°$

$b)\ tan\frac{2\pi}{11}$

$c)\ sec17°$

Ex4) Evaluate with a calculator (Round to 4 decimal places.)

a) tan 35°

b) cot 35°

c) csc 5

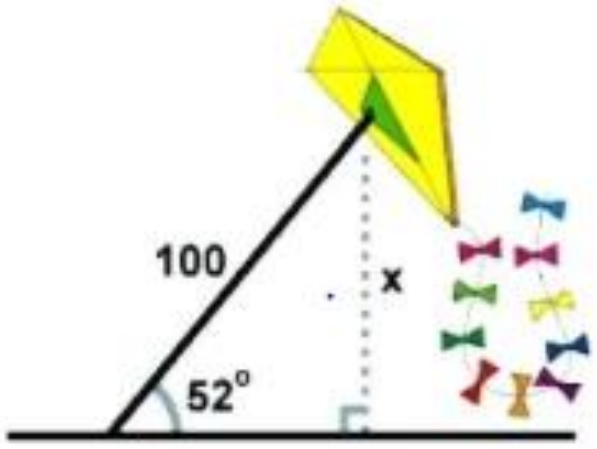
d) cot $\frac{7\pi}{5}$

Ex5) Use a calculator to find the value of the acute angle $\theta$ in radians, round to 3 decimal places.

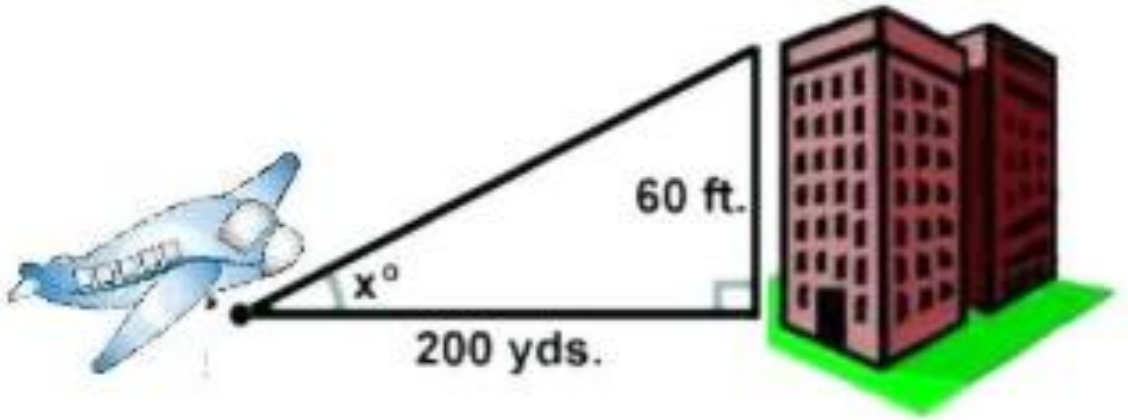
$a)\ sin\theta = 0.9499$

$b)\ tan\theta = 0.5117$

Ex.6) A girl flies a kite with a 100 foot string. The angle of elevation of the string is $52°$. How high off the ground is the kite?
Round answer to 3 decimal places.



Ex. 7) An airplane takes off 200 yards in front of a 60 foot building. At what angle of elevation must the plane take off in order to avoid crashing into the building? Assume that the airplane flies in a straight line and the angle of elevation remains constant until the airplane flies over the building. Round answer to 3 decimal places.



Ex.8) Find each value of $\theta$ in degrees $(0° < \theta < 90°)$ and radians $(0 < \theta < \frac{\pi}{2})$ without a calc.

$a) \cot\theta = \frac{\sqrt{3}}{3}$

$b) \sec\theta = \sqrt{2}$

Ex.9) Evaluate:

$a)\ tan\frac{\pi}{4} + \csc\frac{\pi}{6}$

$b)\ 6tan\frac{3\pi}{4} + sin\frac{\pi}{3}sec\frac{\pi}{6}$