Pre-Calculus
Sec. 4.4
Trigonometric Functions

Important Right Triangle
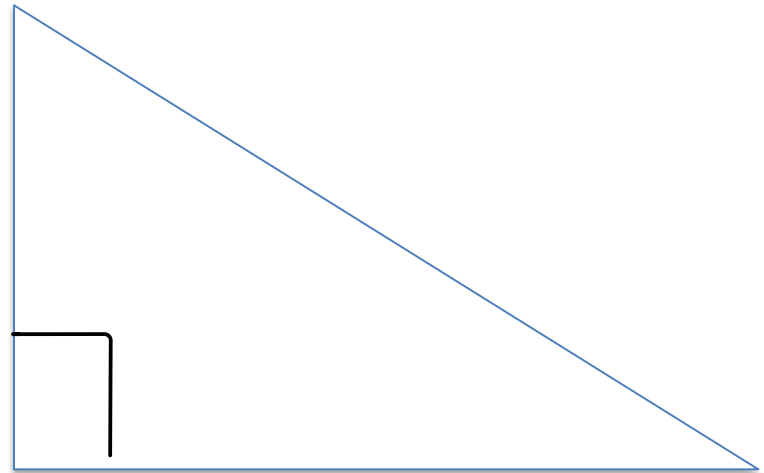## Pythagorean Triplets to Memorize:

side – side – hypotenuse

3 – 4 – 5

5 – 12 – 13

7 – 24 – 25

8 – 15 – 17

9 – 40 – 41

Ex.1) Find the value of the six trig. functions if the terminal side of θ passes through the point (−5, 1).

Ex.2) Find the reference angle for θ. Sketch θ and θ'.

a) θ = 213°   b) θ = 1.7

Ex.3) State the quadrant in which θ lies.

a) sinθ > 0 and cosθ < 0

b) cotθ < 0 and cscθ < 0

Ex.4) Evaluate:

$a) \sin \dfrac{5\pi}{3}$

$b) \cos(-60°)$

$c) \tan \dfrac{11\pi}{6}$

$d) \quad \cot 315^{o}$

$e) \quad \sec -\dfrac{2\pi}{3}$

$f) \quad \csc \dfrac{9\pi}{4}$

Ex.5) Find the exact value of the expression. Write the answer as a single fraction.
$$\sin\frac{3\pi}{2}\tan\left(-\frac{8\pi}{3}\right)+\cos\left(-\frac{5\pi}{6}\right)$$

Ex.6) Find two solutions of the equation, in degrees $(0° \leq \theta < 360°)$ and radians $(0 \leq \theta < 2\pi)$. No calculator.

$$a) \cos\theta = -\frac{\sqrt{2}}{2}$$

$$b) \csc\theta = -\frac{2\sqrt{3}}{3}$$

Ex. 7) If f(θ) = sinθ and g(θ) = cosθ, find the exact value of the following (no calculator) if θ = 225° :

a) f(θ) + g(θ)

b) [g(θ)]²

a) 2f(θ)

EX. 8)
Right Triangles: At a point 150 feet from the base of a building with a smokestack on top of it, the angle of elevation to the **bottom** of the smokestack is 35°, and the angle of elevation to the **top** is 50°. Find the height of the smokestack. Round to the nearest thousandth.

Ex.9) Review: LINEAR SPEED
A satellite in a circular orbit 1250 km above Earth makes one complete revolution every 110 minutes. Assume that Earth is a sphere of radius 6400 km.

A) What is its angular speed in radians per minute (in terms of π)?

B) What is its linear speed in km per hour?
Give the answer in terms of π (exact form). Then use a calculator to give the answer rounded to 3 decimal places.