

Math 1613 - Trigonometry

Exam #1 - 2018.09.12

Name: _____

1. Find the values of the angles α , β , and γ using the image below:

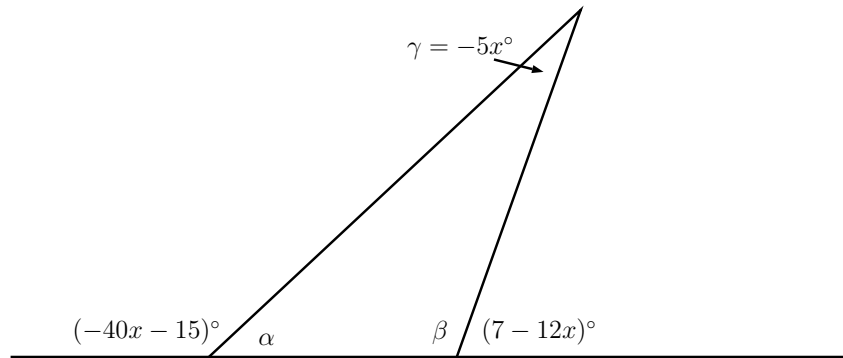


FIGURE 1. Excellent picture to go along with problem 1

2. Find the values of all 6 trigonometric functions for the angle between the positive x-axis and the line segment starting at the origin and terminating at the point $(-2, 2\sqrt{3})$.

3. Fill out the following table completely:

θ	0°	30°	45°	60°	90°	120°	135°	150°	180°
$\sin(\theta)$									
$\cos(\theta)$									

4. Find $\sec(\theta)$ given that $\tan(\theta) = \frac{\sqrt{7}}{3}$ and θ is in quadrant III.

5. Find $\csc(\theta)$ given that $\cot(\theta) = -\frac{1}{2}$ and θ is in quadrant IV.

6. Find an angle α belonging to quadrants I or II such that the following equation holds:

$$\cos(2\alpha + 50^\circ) = \sin(2\alpha - 20^\circ)$$

7. Determine which is larger, $\sin(46^\circ)$ or $\cos(46^\circ)$.

8. Evaluate $\cot^2(135^\circ) + \tan^4(60^\circ) - \sin^4(180^\circ)$.

9. Convert $23^\circ 15'$ to decimal degree.

10. Perform the following calculation: $110^\circ 25' - 92^\circ 43'$.

11. You drag your 6 ft tall favorite math professor outside, and measure his shadow, which happens to be 2 feet long. The Math buildings shadow, at this time, happens to be 11 feet long. How tall is the Math building?

12. Use the trigonometric identity $\sin^2(\theta) + \cos^2(\theta) = 1$ to derive two more trigonometric identities, the first involving $\tan^2(\theta)$, and the second involving $\cot^2(\theta)$.