## Algebra 2/Pre-Calculus

**Name**_____

More Problems Involving Circular Trig (Trigonometry, Day 3)

In this handout we will continue using the circular trig definitions ($x$, $y$, and $r$, rather than adjacent, opposite, and hypotenuse). All of the problems on this handout should be done **without the aid of a calculator**.

**1.** Find each of the following. Do not use a calculator. ***Note:*** Answers are provided at the end of this problem.

**a.** Suppose $\sin\theta = \frac{3}{5}$ and $0^\circ \le \theta < 90^\circ$. Find $\cos\theta$ and $\tan\theta$. ***Hint:*** Start by drawing a triangle in the first quadrant. What are the values of $y$ and $r$? What is the value of $x$?

**b.** Suppose $\sin\theta = \frac{3}{5}$ and $90^\circ \le \theta < 180^\circ$. Find $\cos\theta$ and $\tan\theta$. ***Hint:*** Again, start by drawing a triangle. Which quadrant is the triangle in?

**c.** Suppose $\sin\theta = \frac{3}{5}$ and $180^\circ \le \theta < 360^\circ$. Is this even possible? Explain why or why not.

**d.** Suppose $\cos\theta = \frac{12}{13}$. Find two possible values for $\sin\theta$.

**e.** Suppose $\sin\theta = -\frac{4}{5}$. Find two possible values for $\cos\theta$.

**f.** Suppose $\tan\theta = \frac{7}{24}$. Find two possible values for $\sin\theta$.

**g.** Suppose $\tan\theta = \frac{12}{5}$ and $\sin\theta = -\frac{12}{13}$. Find the value of $\cos\theta$.

Answers

a. $\cos\theta = \frac{4}{5}$ and $\tan\theta = \frac{3}{4}$ b. $\cos\theta = -\frac{4}{5}$ and $\tan\theta = -\frac{3}{4}$ c. Impossible because $\sin\theta$ is not positive in quadrants 3 and 4. d. $\sin\theta = \frac{5}{13}$ or $\sin\theta = -\frac{5}{13}$ e. $\cos\theta = \pm\frac{3}{5}$

f. $\sin\theta = \pm\frac{7}{25}$ g. $\cos\theta = -\frac{5}{13}$

**2.** You are given the facts that $\sin 35^\circ = 0.57$ and $\cos 35^\circ = 0.82$. Find each of the following. ***Note:*** No calculators!

**a.** Find $\cos 215^\circ$. ***Hint:*** Start by sketching two triangles: One in the first quadrant and one in the third quadrant. In both cases, let $r = 1$. ***Another hint:*** $215 = 35 + 180$.

**b.** Find $\sin 215^\circ$. ***Hint:*** You can use the diagram from part **a**.

**c.** Find $\cos 145^\circ$. ***Hint:*** Start by sketching two triangles: One in the first quadrant and one in the second quadrant. In both cases, let $r = 1$. ***Another hint:*** $145 = 180 - 35$.

**d.** Find $\sin 145^\circ$.

**e.** Find $\cos 125^\circ$. ***Hint:*** Start by sketching two triangles: One in the first quadrant and one in the second quadrant. In both cases, let $r = 1$. ***Another hint:*** $125 = 35 + 90$.

**f.** Find $\sin 125^\circ$.

**g.** Find $\cos 55^\circ$. ***Hint:*** $55 = 90 - 35$.

**h.** Find $\sin 55^\circ$.

Answers

a. -0.82 b. -0.57 c. -0.82 d. 0.57 e. -0.57 f. 0.82 g. 0.57 h. 0.82