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More Problems Involving Circular Trig (Trigonometry, Day 3)

In this handout we will continue using the circular trig definitions (x, y, and r, r) ather 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  $\sin \theta$ .

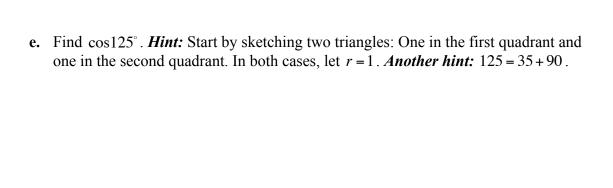
**g.** Suppose  $\tan \theta = \frac{12}{5}$  and  $\sin \theta = -\frac{12}{13}$ . Find the value of  $\cos \theta$ .

## 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. <i>Note:</i> No calculators!			
	<b>a.</b> Find $\cos 215^\circ$ . <i>Hint:</i> Start by sketching two triangles: One in the first quadrant and one in the third quadrant. In both cases, let $r = 1$ . <i>Another hint:</i> $215 = 35 + 180$ .			
	<b>b.</b> Find sin 215°. <i>Hint:</i> You can use the diagram from part <b>a</b> .			
	c. Find $\cos 145^{\circ}$ . <i>Hint:</i> Start by sketching two triangles: One in the first quadrant and one in the second quadrant. In both cases, let $r = 1$ . <i>Another hint:</i> $145 = 180 - 35$ .			
	d. Find sin145°.			
	u. Find Shifts.			



**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