

**MATH. 125, QUIZ 5 - Section 4.3 & 4.4** (25points = 5% final grade) - *Fall 2009***Show your work - no credit for just writing down the final answer!**

1. (5 points each) In a right triangle,  $\sin \theta = \frac{3}{4}$  sketch the triangle and evaluate  $\cos \theta$  and  $\tan \theta$ . Show your work. Do not use a calculator.

(a) Solutions: The shortest leg of that triangle is equal to  $\sqrt{4^2 - 3^2} = \sqrt{7}$  so  $\cos \theta = \frac{\sqrt{7}}{4}$  and  $\tan \theta = \frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$

2. (5 points each) In a right triangle,  $\tan \theta = 4$ . Sketch the triangle and evaluate  $\sin \theta$  and  $\csc \theta$ . Show your work. Do not use a calculator.

(a) Solution: The longest leg of the triangle is equal to  $\sqrt{4^2 + 1^2} = \sqrt{17}$  so  $\sin \theta = \frac{4}{\sqrt{17}} = \frac{4\sqrt{17}}{17}$  and  $\csc \theta = \frac{\sqrt{17}}{4}$

3. (5 points each)  $\sin \theta = -\frac{2}{5}$ ,  $\theta$  is located in the third quadrant. Based on the information provided find the exact value of  $\cos \theta$

(a) Solution:  $\cos \theta = \pm \sqrt{1 - \sin^2 \theta} = \pm \sqrt{1 - \left(-\frac{2}{5}\right)^2} = -\sqrt{\frac{25-4}{25}} = -\frac{\sqrt{21}}{5}$

4. 5 points) A plane rises from take-off and flies at an angle of  $9^\circ$ . When it has gained 750 feet, find the distance to the nearest foot, the plane has flown.

Solution (compare Ex. 57 on page 486):

$$\sin 9^\circ = \frac{750}{d} \text{ so } d = \frac{750}{\sin 9^\circ} \approx 4794 \text{ feet.}$$

5. Find **two** values of  $\theta$  such that  $\cos \theta = 0.5$ , write your answer in degrees.

Answer:  $\theta = 60^\circ$ . or  $\theta = -60^\circ$  (there are many other solutions)