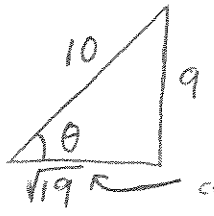
M1060-2 QUIZ 3 (Spencer Stirling) - September 16, 2010

Directions: You may attach more sheets if necessary. SHOW ALL WORK and CLEARLY mark your solutions.

1) (5 points TOTAL, (d) is worth 2 of these points) Suppose $\pi \leq \theta \leq \frac{3\pi}{2}$, and suppose that $\sin(\theta) = -\frac{9}{10}$. Find:

(a) $\sec(\theta) =$

$= \frac{1}{\cos(\theta)} = \frac{hyp}{adj} = \boxed{-\frac{10}{\sqrt{19}}}$



computed using Pythag. thm

In quadrant III

$\sin(\theta) \leq 0$

$\cos(\theta) \leq 0$

$\tan(\theta) \geq 0$

$\sec(\theta) \leq 0$

$\csc(\theta) \leq 0$

$\cot(\theta) \geq 0$

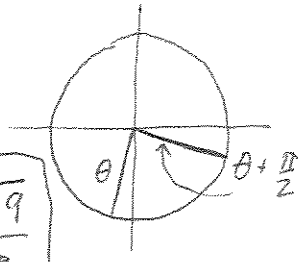
(b) $\cot(\theta) =$

$= \frac{adj}{opp} = \boxed{\frac{\sqrt{19}}{9}}$

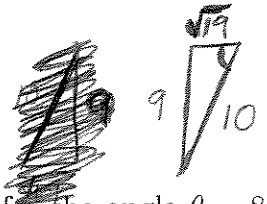
(c) $\csc(\theta) =$

$= \frac{1}{\sin(\theta)} = \frac{hyp}{opp} = \boxed{-\frac{10}{9}}$

(d) $\tan(\theta + \frac{\pi}{2}) =$



$\theta + \frac{\pi}{2}$ sits in quadrant IV, and the $\sin(\theta) \leftrightarrow \cos(\theta)$ have switched places



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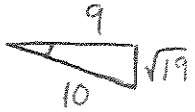
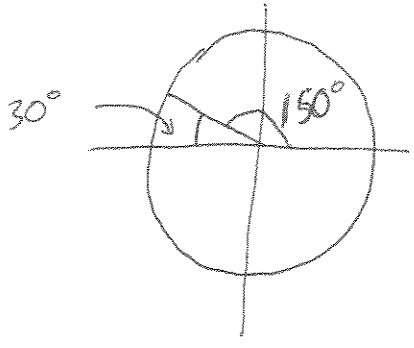


so $\boxed{\tan\left(\theta + \frac{\pi}{2}\right) = -\frac{\sqrt{19}}{9}}$

2) (3 points) Find the reference angle θ' for the angle $\theta = 870°$ and then compute the trig values in parts (b) and (c):

(a) $\theta' =$

$870° = 2(360°) + 150°$ ← this is coterminal to $870°$



$\boxed{\theta' = 30°}$

(b) $\csc(\theta) = \frac{1}{\sin(\theta)} = \frac{1}{\sin(30°)} = \frac{1}{1/2} = 2$

(note: used reference angle θ' here, so must be careful w/ $\pm$ signs)

(c) $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)} = \frac{\sin(30°)}{-\cos(30°)} = -\frac{1/2}{\sqrt{3}/2} = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

3) (3 points) Is the following function even, odd, or neither:

$$f(\theta) = \left(\csc\left(\frac{\sin(\theta^2)+\cos(\theta)}{\tan(\theta^4)}\right)\right)^3 \quad (1)$$

look at $f(-\theta) = \left(\csc\left(\frac{\sin((-\theta)^2)+\cos(-\theta)}{\tan((-\theta)^4)}\right)\right)^3$

$= \left(\csc\left(\frac{\sin(\theta^2)+\cos(\theta)}{\tan(\theta^4)}\right)\right)^3 = f(\theta)$

so $f(\theta)$ is even ✓