Name: Key

Math 151-02 Calculus I – Crawford

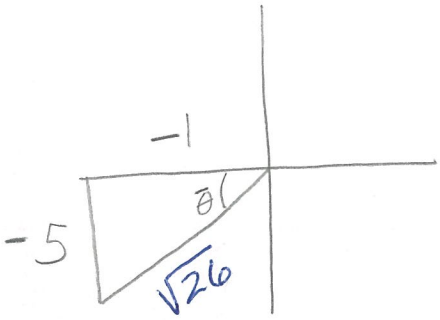
Quiz 2-C

03 October 2017

Books, notes (in any form), and calculators are not allowed. *Show all your work.* Good Luck!

1. (3 pts) If $\tan\theta = 5$ and $\pi \le \theta \le \frac{3\pi}{2}$, use a right triangle to determine $\sin\theta$.

$\tan\theta = \frac{5}{1} = \frac{\text{opp}}{\text{adj}}$ QIII



$(-1)^2 + (-5)^2 = c^2$

$1 + 25 = c^2$

$26 = c^2$ $\rightarrow c = \pm\sqrt{26}$

$\sin\theta = \frac{-5}{\sqrt{26}}$

2. (4 pts) Find *all* solutions to the following equation.

$\tan(4x) = 1$

$4x = \frac{\pi}{4} + 2n\pi$ $\quad x = \frac{\pi}{16} + \frac{2n\pi}{4_2}$

$\Rightarrow$ or $x = \frac{5\pi}{16} + \frac{2n\pi}{4_2}$

or

$4x = \frac{5\pi}{4} + 2n\pi$

All Solns.

$x = \frac{\pi}{16} + \frac{n\pi}{2}$

or

$x = \frac{5\pi}{16} + \frac{n\pi}{2}$

for $n = 0, \pm1, \pm2, \ldots$

3. (4 pts) Find an equation of the tangent line to $y = 2x + 4 - 7\cos x$ at $(0, -3)$.

① pt $(0, -3)$

② slope: $y' = 2 + 7\sin x$

$y'|_{x=0} = 2 + 7\sin(0) = 2 = m$

$$y + 3 = 2(x - 0)$$

4. (4 pts) Differentiate the following. [Do not simplify.]

$y = \left((3x^4 - 2x^3 + 2x)\tan(3x)\right)^4$

$$y' = 4\left((3x^4 - 2x^3 + 2x)\cdot\tan(3x)\right)^3 \cdot \frac{d}{dx}\left[(3x^4 - 2x^3 + 2x)\cdot\tan(3x)\right]$$ ✓CR

$$= 4\left((3x^4 - 2x^3 + 2x)\cdot\tan(3x)\right)^3 \cdot \Big((3x^4 - 2x^3 + 2x)\cdot\sec^2(3x)\cdot 3 + \tan(3x)\cdot(12x^3 - 6x^2 + 2$$ ✓CR