

Name: Key
Math 151-01 Calculus I - Crawford

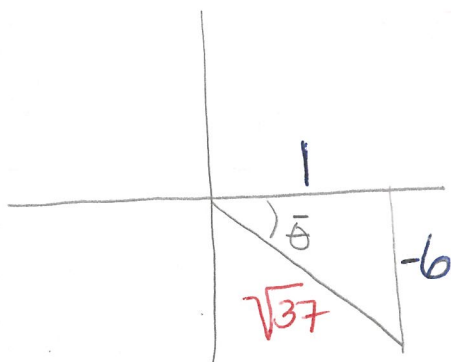
Quiz 2-A
03 October 2017

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

1. (3 pts) If $\tan \theta = -6$ and $\frac{3\pi}{2} \leq \theta \leq 2\pi$, use a right triangle to determine $\cos \theta$.
QIV

$$\tan \theta = -\frac{6}{1} = \frac{\text{opp}}{\text{adj}}$$

$$\cos \theta = \frac{1}{\sqrt{37}}$$



$$(1)^2 + (-6)^2 = c^2$$

$$1 + 36 = c^2$$

$$37 = c^2$$

$$c = \pm \sqrt{37}$$

Choose "+"

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

$$\sin^2 x = \sin x$$

$$\sin^2 x - \sin x = 0$$

$$\sin x (\sin x - 1) = 0$$

$$\sin x = 0 \quad \text{or} \quad \sin x - 1 = 0$$

$$\sin x = 1$$

$$x = 0, \pi$$

$$x = \frac{\pi}{2}$$

All Solutions

$$x = 0 + 2n\pi$$

$$x = \pi + 2n\pi$$

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

for n any integer

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

① pt ✓ $(\pi, -3)$

② slope: $y' = -3 \sin x + 2 \cos x$

$$\begin{aligned} y'|_{x=\pi} &= -3 \sin \pi + 2 \cos(\pi) \\ &= -3(0) + 2(-1) \\ &= -2 = m \end{aligned}$$

$$y + 3 = -2(x - \pi)$$

4. (4 pts) Differentiate the following.

[Do not simplify.]

$$y = \left(\frac{\tan(3x)}{4x^3 + 2x - 3} \right)^5$$

$$\frac{dy}{dx} = 5 \left(\frac{\tan(3x)}{4x^3 + 2x - 3} \right)^4 \cdot \frac{d}{dx} \left[\frac{\tan(3x)}{4x^3 + 2x - 3} \right]$$

$$= 5 \left(\frac{\tan(3x)}{4x^3 + 2x - 3} \right)^4 \cdot \frac{(4x^3 + 2x - 3) \cdot \sec^2(3x) \cdot 3 - \tan(3x) \cdot (12x^2 + 2)}{(4x^3 + 2x - 3)^2}$$