

Math 1271 Quiz 4

February 20, 2014

Name: SOLUTIONS

TA: _____

NO CALCULATORS. NO HANDHELD DEVICES. NO BOOKS OR REFERENCE MATERIALS OF ANY KIND.

Time allowed: 20 minutes; Grader: Ashley Earls. Good luck!

1. (35 points) Let $f(x) = x^3 - 6x^2 + 5x - 29$. Find all x -values where the tangent line to f at x is parallel to $y = -4x$. (You do not need to give the corresponding y -values.)

$$f'(x) = 3x^2 - 12x + 5$$

$$3x^2 - 12x + 5 = -4$$

$$3x^2 - 12x + 9 = 0$$

$$3(x^2 - 4x + 3) = 0$$

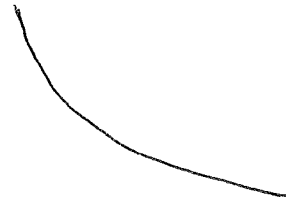
$$3(x-1)(x-3) = 0$$

$$x=1 \quad \text{and} \quad x=3$$

2. (15 points, no partial credit) True or false? Let $f(x)$ be any function that is concave up on $a < x < b$. Then $f(x)$ is increasing on $a < x < b$.

True

False



3. (15 points, no partial credit) True or false?

$$\cos x = \frac{d}{dx}(\sin x) = \frac{d}{dx} \left(\underbrace{\frac{d}{dx}(\cos x)}_{-\sin x} \right) = -\cos x$$

True

False

4. (35 points) Let $f(x) = \frac{12e^x + 7x^4}{x-3}$. Compute $f'(x)$.

$$f'(x) = \frac{[x-3][12e^x + 28x^3] - [12e^x + 7x^4][1]}{[x-3]^2}$$

PLEASE SEE THE OTHER SIDE FOR MORE PROBLEMS.