Math 241 Fall 2018 Professor MG
Classwork 3 Name: _____

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise.

1. (*0 points*) Find the derivative of the following functions: (You do not need to simplify)

(a) $f(x) = \dfrac{4x-2}{2x^2}$

(b) $f(x) = (x^2+1)\left(x+5+\dfrac{1}{x}\right)$

(c) $y = \dfrac{2x+5}{2x-2}$

(d) $y = \dfrac{5x+1}{2\sqrt{x}}$

(e) $y = (x-1)(x^2+x+1)$

2. (*0 points*)

(a) Find an equation for the normal line to the curve $y = x^3 - 4x + 1$ at the point $(2, 1)$.

(b) Find equations for the tangents to the curve at the points where the slope of the curve is 8.

3. (*0 points*) Find the first and second derivative of the following functions:

(a) $f(x) = -x^2 + 3$

(b) $f(x) = \dfrac{x^3}{3} + \dfrac{x^2}{2} + \dfrac{x}{4}$

(c) $r(\theta) = \dfrac{2}{\theta} - \dfrac{3}{\theta^3} + \dfrac{1}{\theta^4}$

4. (*0 points*) At time t seconds, the position of a body moving along the x-axis is $s(t) = t^3 - 6t^2 + 9t$ meters.

(a) Find the body's acceleration each time the velocity is zero.

(b) Find the body's velocity each time the acceleration is zero.