

QUIZ 6 (GROUP WORK)

GOOD LUCK

- Show all your work and indicate your final answer clearly. You will be graded not merely on the final answer, but also on the work leading up to it.

1. (3pts) Let $f(3) = 1$, $f'(3) = 2$, $g(3) = 4$, $g'(3) = 5$. Find the value of

(a) $(f + g)'(3)$

(b) $(g/f)'(3)$

(c) $(fg)'(3)$

• $f'(3) + g'(3) = 2 + 5 = \boxed{7} + 1$

• $\left(\frac{g}{f}\right)'(3) = \frac{f(3)g'(3) - g(3)f'(3)}{(f(3))^2}$

$= \frac{1 \cdot 5 - 4 \cdot 2}{1^2} = 5 - 8 = \boxed{-3} + 1$

• $(fg)'(3) = f'(3)g(3) + g'(3)f(3) = 8 + 5 = \boxed{13} + 1$

2. (2pts) Find the second derivative of the following function: $f(x) = \sin(3x) + 2x \cos(4x)$.

$f''(x) = \underbrace{-9 \sin(3x)}_{+1} - \underbrace{16 \sin(4x) + 32x \cos(4x)}_{+1}$

(simple product rule)

(easy to simplify + b h, so -1 for not doing so)

Names:

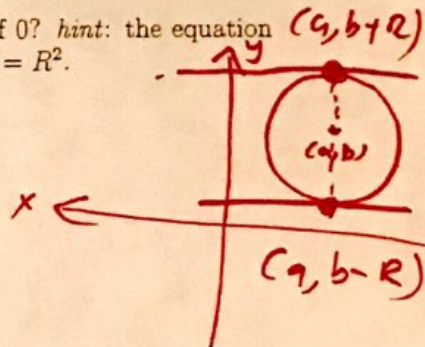
MATH 151, Fall 2017

Section:

3. (5pts) At what point(s) on a circle does its tangent lines have a slope of 0? *hint: the equation of a circle with center (a, b) and radius R is given by $(x - a)^2 + (y - b)^2 = R^2$.*

Using implicit differentiation:

Take derivative w.r.t x :



$$2(x-a) + 2(y-b) \frac{dy}{dx} = 0$$

\Rightarrow

$$\frac{dy}{dx} = -\frac{(x-a)}{(y-b)} + 2$$

$$\frac{dy}{dx} = 0 \Rightarrow \boxed{x=a} + 2$$

Plug into eqn, so points are

$$(a, b+R), (a, b-R)$$