Calculus I **Name (Print):** _____
Fall 2020
Lab 5

Show all your work, cite your sources, and type your answers for full credit.

Materials needed: none

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1. (0 points) (In Class Activity) draw a function and the derivative of that function on the same graph. Draw the derivative of the derivative function (this is called the second derivative) on that same graph as well. Label each I, II, III and provide the answers under a piece of paper taped on the white board

2. (5 points) Using what you've learned from Calculus lecture, find a formula for

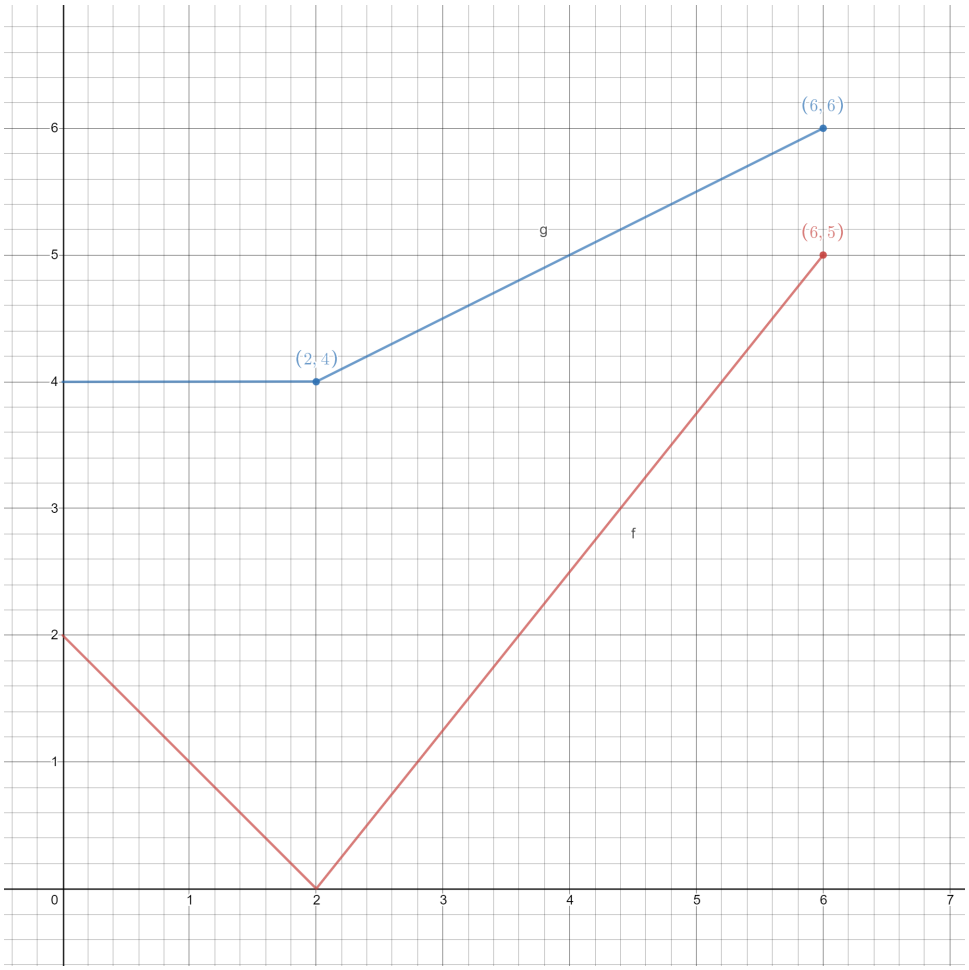
$$\frac{d}{dx}\left(\frac{f(x)}{g(x)h(x)}\right)$$

3. (5 points) Using what you've learned from Calculus lecture, find a formula for

$$\frac{d}{dx}\Big(f(x)g(x)h(x)\Big)$$

4. (5 points) Find the three tangent lines to the curve $f(x) = (x+2)(x-3)(x+4)$ that go through the point $(4, -7)$.

5. (10 points) Let f and g be defined by the graph below.



Let

$$r(x) = f(g(x)) \qquad s(x) = g(f(x)), \qquad t(x) = f(x)g(x), \qquad u(x) = \frac{f(x)}{g(x)}$$

Compute the following:

(a) $r'(1)$
(b) $r'(4)$
(c) $s'(1)$
(d) $s'(4)$
(e) $t'(1)$
(f) $t'(4)$
(g) $u'(1)$
(h) $u'(4)$