

SECTION 3-3: DERIVATIVE RULES (DAY 2)

1. Find the derivative of each of the following. Use whatever rule you choose. Simplify if you have time.

(a) $G(x) = \frac{x^2}{8+x^2}$

(b) $K(x) = \frac{8+x^2}{x^2}$

(c) $H(x) = \frac{1}{3x}(8 + x^2)$

(d) $f(x) = 5e^2 + 4x^{3/4} + 5x \sin(x)$

(e) $g(x) = \frac{2}{3} - \frac{2}{x} + \frac{x}{2} + \frac{\cos(x)}{x+6}$

2. Determine the point (or points) where the graph $f(x) = x^3$ has a slope of 2.
3. An ant walking along a sidewalk has traveled $s(t) = t^4 - 2t^2$ inches in t minutes. Find the acceleration of the ant (with units) when the velocity of the ant is 0.
4. The concentration of an antibiotic in the bloodstream t hours after being injected is given by $C(t) = \frac{2t^2 + t}{t^3 + 50}$ where C is measured in milligrams per liter of blood.
- (a) Find $C(0)$ and $C(10)$ and explain what these numbers mean in the context of the problem.
- (b) It is a fact that $C'(t) = \frac{-2(t^4 + t^3 - 100t - 25)}{(t^3 + 50)^2}$. What are the units of $C'(x)$?
- (c) It is a fact that $C'(10) = -0.018$. Interpret this fact in the context of the problem. Use language a Precalculus student could understand.
- (d) Use the fact from parts (a) and (c) to make a guess about $C(11)$.