

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)  $v(\theta) = \sqrt{\theta} \cos(\theta)$

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

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

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  $C(11)$ .