1. Review: Write the Product Rule and the Quotient Rule for differentiation.

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

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

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

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

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

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

3. Determine the x-value (or values) where the graph $f(x) = x^3$ has a slope of 2.

4. An ant walking along a sidewalk has traveled $s(t) = t^4 - 2t^2$ inches in t minutes. Find the velocity and acceleration of the ant (with units).

5. The concentration of an antibiotic in the bloodstream t hours after being injected is given by $C(t) = \dfrac{2t^2 + t}{t^3 + 50}$ where C is measured in milligrams per liter of blood.

   (a) It is a fact that $C(0) = 0$ and $C(10) = 0.20$. Explain what these numbers mean in the context of the problem.

   (b) 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.

   (c) Use the fact from parts (a) and (c) to estimate $C(11)$.

3-3 Derivative Rules (day 2)