1) Lauren is solving calculus problems at a rate of 1.5 problems every minute. Meanwhile, right next to her, Adrienne is telling Samantha about all of her grade drama. She is talking at a rate of 120 words for every problem that Lauren solves. How fast is Adrienne talking in words per minute?

2) Mussman and Hamidou are airline pilots who would like to take off but can't because Matthew is in charge of fueling their plane and there is a leak that he is too distracted to notice. The amount of fuel in the tank in gallons at this time is given by $Q(t) = 2t^3 - 39t^2 + 180t + 170$ where t is measured in minutes from the time that they began fueling.

   a) When did the fuel level first begin to drop?

   b) When did the fuel level finally start to level off and rise again?

   c) What was the fuel level at this time?

Find the derivative of each expression.
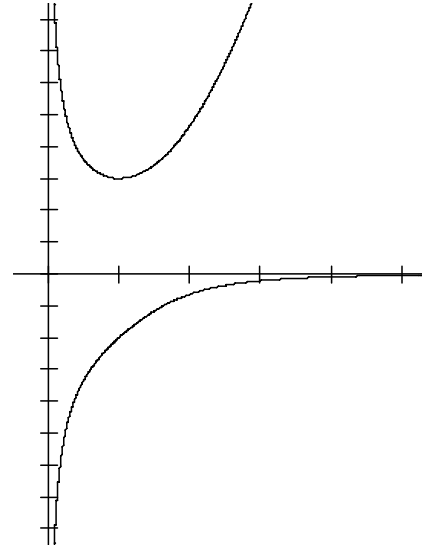
3) a) $\cos^2\left(\dfrac{1}{\sqrt{x^3-2x}}\right)$

b) $\cos\left(e^{x^3-2x}\right)$

4) $\tan^{-1}(\sec x)$

5) $\sin^{-1}(5^{3x})$

6) Given the equation $xy^2 - x^3y = 6$ graphed below

a) Find the slope of the line tangent to the graph at the point (1, 3)

b) Find the other point on the curve where the x coordinate is 1 and find the equation of the tangent line there.

7) $y = x^{\frac{1}{x}}$ Find y'