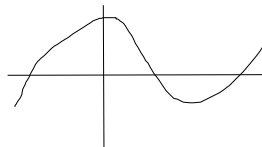


1. You leave home for calculus, driving faster and faster until a cop pulls you over. Luckily, you use Calculus to avoid a ticket. Then you drive off slowly to class. Sketch a graph of the distance you are from class as a function of time.
2. You make T-shirts. You have fixed costs of \$150 and variable costs of \$8 per shirt. Find the cost equation. If you sell the shirts for \$15 each, find the break-even point ? Graph both the revenue and the cost function.
3. The depth of water in a tank oscillates once every 3.5 hours. The smallest depth is 2.2 feet and the largest is 5.7 feet. Find a formula for the depth as a function of time.
4. You are selling iced cappuccino's. If you charge one dollar, you end up making 600 sales every week. Each dime increase in price results in 20 fewer sales. Find and graph the demand curve. Assume it is linear.
5. You have a budget for textbooks and social events of \$2000. Textbooks cost \$100 each. A night out costs \$50. Find and graph the equation of your budget constraint. Shade in the region of living within your means. What do points on the axes represent ?
6. Suppose $f(10) = 38.1$ and $f(40) = 72.7$. Find two possible values for $f(70)$, one if f is linear and the other if f is exponential.
7. Find the doubling time of a population with continuous growth rate of 6.32%.
8. The half-life of Mobilium is 8 hours. How long before 20 grams decays into 12 grams
9. Estimate the rate of change of $y = x^2 + 2^x$ at $x = 1$ using the intervals $[1, 1.5]$ and $[1, 1.1]$.
10. How is the graph of $y = -2f(x - 3) + 5$ gotten from that of $y = f(x)$?
11. Let $f(v)$ be the fuel efficiency of a car in mpg that is driven at an average speed v mph. What are the units of $f'(v)$? What would $f'(75) = -.3$ tell you ?
12. Suppose $P(t)$ is a price of a stock as a function of time. What does the statement "the stock price has fallen and is bottoming out" say about the sign of $P'(t)$ and $P''(t)$?
13. Suppose you know for a fact that the derivative of $f(x) = \ln(x)$ is $f'(x) = 1/x$. Find the equation of the tangent line at $x = 2$.
14. Sketch the graph of a function defined for whose first derivative is always negative but whose second derivative starts out positive and changes it sign twice.
15. Suppose $MR(100) = 45$ and $MC(100) = 72$. Estimate what happens to the profit if the production is changed to a level of $q = 96$.
16. A ball is tossed up in the air. A total of 9 seconds elapses from the moment it is tossed until it hits the ground. Sketch a graph of the velocity as a function of time for $0 \leq t \leq 9$.
17. Sketch a graph of a function with $f(2) = 10$, $f'(2) = -1$ and $f''(2) = 0$.
18. A frozen pizza takes a trip from the freezer, to the oven, and then to your plate. Let $T(t)$ be its average internal temperature. Sketch the graphs of $T(t)$ and $T'(t)$.

19 Sketch a graph of $f'(x)$ given the graph of $f(x)$:



20. Review all the quizzes, lectures, homework, and everything else.