Questions to guide your reading:

Sections 1.2-1.3

- Think about what's happening to the "slope" of a curve that is concave up or down. (note: we've talked about slope of a line, the slope of a curve(at any point) can be thought of as the slope of the tangent line (at that point))
- If f is increasing on the interval (a,b), then is the average rate of change of f positve or negative on that interval.
- What is the difference between total change and average rate change? Think about the units of each.

Section 1.4

- Be comfortable with the following terminolgy: Cost function, revenue function, profit function, supply curve, demand curve, break even point, equilibrium point, specific tax, and sales tax
- What's the difference (conceptually) between the break even point and the equilibrium point and how do you find each?
- Does a sales tax imposed on producers effect producers only, consumers only, or both producers and consumers?

Sections 1.5-1.7

- Be comfortable with the following terminology: doubleing time, half-life, base of the exponent, relative growth rate, growth rate, properties of natural logarithm
- Think about how the equation of an exponential function relates to it's graph. What does the vertical intercept represent? How fast is the exponential growth or decay? How are these quantities represented in the equation?
- Think of all the ways to write an exponential function. What makes one way better (for a given problem) than another?

Section: Regression: Fitting formulas to Data

- What is regression?
- How do you decide which type of regression is appropriate for a given problem (ie-linear, exponential, etc.)

Sections 2.1-2.2

- What is the difference between instantaneous rate of change and average rate of change?
- What does the derivative function tell you graphically?
- What is the difference between derivative at a point and the derivative function?

Sections 2.3-2.4

- If $f'(20) = -4$ and $f(20) = 8$, approximate $f(21)$.
- Be able to interpret the derivative as in examples 1-6 in section 2.3.
- What does the second derivative tell you about f' and f?

Section 2.5

- What do marginal cost and marginal revenue have to do with derivatives?
- Interpret MC(30)=\$.5 per unit and MR(30)=\$2 per unit.
- If MR=MC, does this mean profit is maximized?

Sections 3.1-3.2

- Know the derivative formulas.

Sections 3.3-3.4

- How do you know when to use each of the following: chain rule, product rule and quotient rule
- Do you ever need more than one?

Sections 4.1-4.3

- What is a critical point? How do you check to see if it is a max, min, or neither?
- Don't worry about the difference between local and global, just know how to find a max or min of a given function.
- What's happening to $f'(x)$ at an inflection point of f?

Section 4.4

- What two ways are there to maximize profit?
- Given a demand function, how do you maximize revenue?

Sections 4.5-4.6

- What two ways are there to minimize average cost?
- If average cost is greater than marginal cost, what happens to average cost if you increase production by one unit?
- What does it mean when elasticity is 2? What is the optimum value for elasticity?

Section 4.7

- Do all logistic functions have the same shape?
- What is the significance of the inflection point?
- What are logistic functions used to model?

Compound Interest and the number e & Section 11.1

- Describe the difference between effective annual yield and annual percentage rate.
- Given the series $3 + 3^2 + 3^3 + 3^4 + \ldots + 3^7$, what are a, r, n, and S_n?
- Why does $|r|$ have to be less than 1 for an infinite series to converge?

Section 11.2

- Why in examples 2 and 3 on page 426 are the exponents negative?
- In example 2 on page 426, how would the problem change if the interest on the account was compounded monthly rather than annually?

Sections 5.1-5.2

- Given a rectangle that is 5 cubits high and 10 furlongs long, what are the units of it's area?
- When is a right-hand sum and upper sum?
- Graphically, what does $\int_a^b f(t)dt$ represent?

Section 5.3

- When is $\int_a^b f(t)dt$ negative?
- Can you think of an application where you would need to find the area between two curves?

Section 5.4

- If $f(t)$ is a rate of change of a quantity, then what is $\int_a^b f(t)dt$?
- If $f(t)$ is a rate of change, does that mean $f(t)$ should be written as $f'(t)$?
- How do you compute the units of a definite integral?

Section 5.5

- Given the english sentence, "Total cost equals fixed costs plus total variable costs", rewrite it as a mathematical sentence using definite integrals where appropriate.
- In your own words, what does the fundamental theorem of calculus say?

Sections 6.1-6.2

- What's the difference between average value and average cost, both graphically and in words?
- How could you use area between curves (section 5.3) to calculate consumer surplus?
- If producer surplus is $3000, what does this mean?