

REVIEW. This review meant to give you some direction while beginning to prepare for the second exam on November 16. It can act as a starting point for your studying. The test will not be limited to these problems as any type of problem that we have covered in Chapter 7 through Chapter 10 is a viable test question. You must know definitions, rules, algorithms, and theorems in the chapters. There is also a separate review and practice problems posted on your internet homework page. You must also be sufficiently prepared to use any mathematical concepts from chapters 1-6.

- Let $g(x) = x^3 + 8x^2 - 45x - 150$. If p , q , and r are real roots of $g(x)$ where $p = 5$ and $q = -3$ then what does r equal?
- A quadratic $Q(x) = ax^2 + bx + c$ has extrema at $(4, -2)$ and a root at $x=7$. What is the quadratic?
- What is the equation of the tangent line to $y = 2x^2 + 8x - 18$ at the points $x = -1, 3, 0$?
- For what intervals is the function $h(x) = -7x^2 + 14x - 21$ positive and negative?
- A mail order store charges a flat shipping charge of 11 for purchases of up to 50. For each additional 10 the shipping charge increases by 2 however the shipping charge becomes zero after a purchase of more than 150. What is the shipping charge of a 119 purchase and what is the maximum shipping charge? (hint: try to graph it, maximum implies part of the graph is not linear)
- What is the equation of the tangent line to the graph $x^2 - 2x + 144 - 3y^2 + 24y = 0$ at the point $(0, -4)$?
- Determine all intercepts and extrema of the following functions:
 - $y = 3x^2 + 6x - 24$
 - $f(x) = x^2 - 2x + 1$
 - $g(x) + 2 = 3(x - 1)$
 - $h(x) = -3x^2 + 2x - 100$
- Calculate the derivatives of the following functions:
 - $f(x) = x^2 - 4x + 1$
 - $g(x) = x^{-2} + 3x - 1$
 - $h(x) = -2x + 3$
 - $y = \sqrt{(x - 1)(x + 7)}$
- Model a function that goes through the following points $P(0, 5)$, $Q(2, 6)$, $A(-7, -15)$.