1. Solve optimization word problems.
   4.4 #14, 29, 32a (These were done on a written assignment.) Also, see your notes for more examples.

2. Differentials, Linearization, and Linear Approximations
   4.5 #3, 13, 51, 23, 25 (This is not a typo; it’s the order I recommend.)
   Module 7

3. Use Newton’s method to approximate roots.
   4.8 #5, 8
   Module 10
   On the exam you will be given $x_1$ and you will only have to find $x_2$.

4. Rolle’s Theorem and the Mean Value Theorem
   4.6 #7, 11, 17, 19, 29

5. Find antiderivatives.
   4.9 #11 – 55 odd, 81, 85, 87

6. Estimate areas and estimate definite integrals, using Riemann sums.
   5.1 #19, 23, 35, 37, 57
   Module 11

7. Evaluate definite integrals, using areas.
   5.2 #23, 27, 29, 31, 33, 35, 37, 24(ans: 12), 72(ans: 45/2)

8. Evaluate definite integrals, using part II of the Fundamental Theorem of Calculus.
   5.3 #23, 25, 27, 31, 33, 37, 39, 85, 89

9. Use part I of the Fundamental Theorem of Calculus.
   5.3 #59, 61, 63

10. Average value of a function
    5.4 #29, 31, 33

11. Find indefinite integrals, using u-substitution.
    5.5 #17 – 31 odd
    Module 12

12. Find definite integrals, using u-substitution.
    I expect you to change the limits of integration to correspond to "u"
    5.5 #39, 45, 71

(see the next page)
The following formulas will be provided on the exam. However, you still need to practice these topics from the test outline so you know when and how to use each formula.

**Differentials**

\[ dy = f'(x)dx \]
\[ \Delta y \approx f'(a)\Delta x \]

**Linearization**

\[ L(x) = f(a) + f'(a)(x - a) \]
\[ y \approx f(a) + f'(a)\Delta x \]

**Newton’s Method**

\[ x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)} \]

**Rolle’s Theorem**

\[ f'(c) = 0 \]

**Mean Value Theorem** (for functions)

\[ m_{tan} = m_{sec} \]
\[ f'(c) = \frac{f(b) - f(a)}{b - a} \]

**Average Value**

\[ \bar{f} = \frac{1}{b-a} \int_a^b f(x)dx \]