NOTE: The instructions for these assignments are located on our course webpage. Be sure to reread them often.

R9 - Due by 10am W 10/1:

- **To Read:** Sections 2.6
- **Email Subject Line:** Math 211 10/1 Your Name
- **Reading Questions:**
  1. Geometrically, what does the expression \( \frac{f(a + h) - f(a)}{h} \), which appears in the definition of the derivative in this section, represent?
  2. Do formulas 1 (page 142 in text) and 2 (page 144 in text) represent the same quantity? If so, identify the quantity. If not, briefly explain how the two quantities are different.
  3. Is it possible to compute the exact value of the slope of the tangent line to a function at a point, if the function is given as a graph or a table? Why or why not?

R10 - Due by 10am F 10/3:

- **To Read:** Sections 2.7
- **Email Subject Line:** Math 211 10/3 Your Name
- **Reading Questions:**
  1. What are two interpretations of the derivative of a function \( f \) at a point \( P \)?
  2. The distance \( R \) (in feet) that a batted ball, hit at an angle \( \theta \) (in radians, measured from the horizontal), travels before hitting the ground is given by \( R = f(\theta) \). What is the meaning of the derivative \( f'(\frac{\pi}{4}) = 400 \), in terms of baseball?
R11 - Due by 10am M 10/6:

- **To Read:** Sections 2.8
- **Email Subject Line:** Math 211 10/6 Your Name
- **Reading Questions:**
  1. True or False: For a function $y = f(x)$, each of these notations represents the same thing:
     $$f'(x), \frac{dy}{dx}, y', \frac{df}{dx}.$$  
  2. What are the three ways listed in Section 2.8 in which a function can fail to be differentiable at a point?
  3. What does the term *second derivative* mean?

R12 - Due by 10am W 10/8:

- **To Read:** Sections 2.9
- **Email Subject Line:** Math 211 10/8 Your Name
- **Reading Questions:**
  1. Give a reason why (or describe a situation where) we might want to use a function's tangent line instead of the function's formula directly to compute a quantity.
  2. When doing a linear approximation, why is it important to approximate function values by tangent line values only at points that are close to where the tangent line is built?

R13 - Due by 10am F 10/10:

- **To Read:** Sections 2.10
- **Email Subject Line:** Math 211 10/10 Your Name
- **Reading Questions:**
  1. What is meant by the term *antiderivative* of a function $f$?
  2. Give one complete English sentence explaining what the term *concavity* means.
  3. Did you notice that next week’s two days with no classes is not called, “Fall Break”, but rather, “Fall STUDY Break”?
R14 - Due by 10am W 10/15:

- **To Read**: Sections 3.1,3.4
- **Email Subject Line**: Math 211 10/15 Your Name
- **Reading Questions**:
  1. For each function listed, answer “yes” or “no”, indicating whether the differentiation rules in this reading assignment give us enough information to compute $f'(x)$. Your answers should contain no actual calculations.
    (a) $f(x) = \frac{2}{x^2} + \sqrt{x} - 3^x$
    (b) $f(x) = \sin(x^2)$
    (c) $f(x) = e^x \cos(x) + 1$

R15 - Due by 10am F 10/17:

- **To Read**: Sections 3.2
- **Email Subject Line**: Math 211 10/17 Your Name
- **Reading Questions**:
  1. For each function listed, answer “yes” or “no”, indicating whether the differentiation rules in this reading assignment, combined with what we learned previously, give us enough information to compute $f'(x)$. Your answers should contain no actual calculations.
    (a) $f(x) = \frac{2}{x^2} + \sqrt{x} - 3^x$
    (b) $f(x) = \sin(x^2)$
    (c) $f(x) = e^x \cos(x) + 1$

R16 - Due by 10am M 10/20:

- **To Read**: Sections 3.3
- **Email Subject Line**: Math 211 10/20 Your Name
- **Reading Questions**:
  1. What is the difference between average rate-of-change and instantaneous rate-of-change?
  2. Which of the eight examples in this text section did you find most interesting? Why?
R17 - Due by 10am W 10/22:

- **To Read:** Sections 3.5
- **Email Subject Line:** Math 211 10/22 Your Name
- **Reading Questions:**

  1. For each function listed, answer “yes” or “no”, indicating whether the differentiation rules in this reading assignment, combined with what we learned previously, give us enough information to compute \( f'(x) \). Your answers should contain no actual calculations.

     (a) \( f(x) = \frac{5}{x} + \sqrt{x} - 3^x \)

     (b) \( f(x) = \sin(x^2) \)

     (c) \( f(x) = e^x \cos(x) + 1 \)

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R18 - Due by 10am F 10/24:

- **To Read:** Sections 3.6
- **Email Subject Line:** Math 211 10/24 Your Name
- **Reading Questions:**

  1. What is an *implicitly defined function*? Give an example.

  2. The graph of \( x^2 + y^2 = 1 \) is a circle of radius 1, centered at the origin. Does this graph appear locally linear to you? Does this mean that this circle (which is not even a function) can have a tangent line (i.e. a derivative) at each point?

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R19 - Due by 10am M 10/27:

- **To Read:** Sections 3.7
- **Email Subject Line:** Math 211 10/27 Your Name
- **Reading Questions:**

  1. What purpose does logarithmic differentiation serve?

  2. What is the value of the limit \( \lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n \)?

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R20 - Due by 10am W 10/29:

- **To Read:** Sections 3.8
- **Email Subject Line:** Math 211 10/29 Your Name
- **Reading Questions:**

  1. What information is needed to write an equation for the linear approximation to a function \( f(x) \) at a point \( x = a \)?

  2. True or False: Linear approximation and tangent line approximation are the same thing.

  3. What is the name of your partner for Mini-Project 2?
R21 - Due by 10am W 11/5:

- **To Read:** Sections 4.2
- **Email Subject Line:** Math 211 11/5 Your Name
- **Reading Questions:**
  1. For a function $f(x)$ defined on an interval $[a, b]$, explain the distinction between a *local* maximum point and a *global* maximum point of $f$.
  2. What are *critical numbers*?