1. Find \( f'(-3) \), given \( f(x) = \sqrt{5 - x} \)

2. Find the equation of the tangent line to the curve \( f(x) = \frac{3x+4}{1-x} \) at \( x = 2 \)

3. If the tangent line to \( y = f(x) \) at \((5,2)\) passes through the point \((0,-1)\), find \( f(5) \) and \( f'(5) \).

4. Sketch a graph of \( f'(x) \) given the graph of \( f(x) \) below.

5. Use the limit definition of the derivative to find \( f'(x) \) given that \( f(x) = 5x^3 - 4x^2 + 7 \).

6. The graphs of \( f(x) \), \( f'(x) \) and \( f''(x) \) are given below. Label the curves appropriately.

7. Estimate the slope of the tangent line at each point on the graph below:

8. Use the graph from problem #7 to determine the intervals where the function is
   a. Increasing     b. Decreasing     c. Concave up     d. Concave down
9. Use the graph from problem #7 to determine where the function has
   a. Local extrema      b. Inflection points

10. Sketch a graph of the function that satisfies the following conditions.
    a. \( f'(1) = f'(3) = 0 \)
    b. \( f'(x) > 0 \) on \((-\infty, 1) \cup (3, \infty)\)
    c. \( f'(x) < 0 \) on \((1, 3)\)

11. Sketch a graph of \( f(x) \), given the following conditions:
    a. Domain is \((-\infty, \infty)\)
    b. \( f(-3) = -2, f(0) = 1, f(3) = -3, f(5) = -7, f(7) = -3 \)
    c. \( \lim_{x \to \infty} f(x) = 2, \lim_{x \to -\infty} f(x) = -6 \)
    d. \( f'(x) > 0 \) on \((-\infty, 0) \cup (5, \infty)\)
    e. \( f'(x) < 0 \) on \((0, 5)\)
    f. \( f''(x) > 0 \) on \((-\infty, -3) \cup (3, 7)\)
    g. \( f''(x) < 0 \) on \((-3, 3) \cup (7, \infty)\)

12. Where is the graph of \( f(x) \) non differentiable? Give reasons for each case.

Note: With many thanks to Kendra Kilmer