

Suggested Problems for Tuesday, September 11 and Wednesday, September 12

For each of the following functions:

- (i) Find the intervals on which the following functions are increasing/decreasing.
- (ii) Identify all critical points.
- (iii) Determine whether each critical point corresponds to a local maximum, local minimum, or neither.
- (iv) Find all inflection points.
- (v) Determine the concavity of the function on intervals between consecutive inflection points.
- (vi) Graph the function.

1. $f(x) = x\sqrt{16 - x^2}$ on the interval $[-4, 4]$.

2. $g(x) = 2x^3 + 9x^2 - 60x + 17$

3. $y = |(2x - 1)(x - 3)|$

4. $h(x) = \frac{2x - 8}{1 - x^2}$

5. $y = \ln(x^2 + 1)$

6. $y = x \ln x$

7. $y = xe^{-x}$

For additional practice with increasing/decreasing functions and critical points, look at problems 1–52 in Section 3.1.

For additional practice with higher-order derivatives, look at problems 42–47 in Section 2.3 and problems 51–56 in Section 2.4.

For additional practice with concavity and points of inflection, look at problems 1–52 in Section 3.2.