Practice Problems - Lectures 13-14

**Problem 1.** Determine the intervals of the domain over which each function is continuous:



**Problem 2.** For the following piecewise-defined functions, find f(-5), f(-1), f(0), and f(3), and then sketch the graph:

(a) 
$$f(x) = \begin{cases} x - 2 & \text{if } x < 3 \\ 5 - x & \text{if } x \ge 3 \end{cases}$$
;  
(b)  $f(x) = \begin{cases} -2x & \text{if } x < -3 \\ 3x - 1 & \text{if } -3 \le x \le 2 \\ -4x & \text{if } x > 2 \end{cases}$ .

**Problem 3.** Without graphing, determine whether each equation has a graph that is symmetric with respect to the x-axis, the y-axis, the origin, or none of these: (a)  $y = 2x^4 - 3$ ; (b)  $y^2 - x^2 = -6$ ; (c)  $y = x^3 - x$ ; (d) y = x + 15.

**Problem 4.** Determine whether each function is even, odd, or neither:

(a)  $f(x) = x^5 - 2x^3$ ; (b)  $f(x) = 0.75x^2 + |x| + 4$ ; (c)  $f(x) = x^4 - 5x + 8$ . **Problem 5.** Graph each of the following functions by identifying the parent graph and sketching the transformations one at a time:

(a)  $y = x^3 - 2;$ (b) y = |x - 4|;(c)  $y = -\sqrt[3]{x};$ \*(d)  $y = -(x - 1)^2;$ \*(e)  $y = \sqrt{-x} + 3.$ 

**Problem 6.** Suppose the point (-2, 3) is on the graph of y = f(x).

(a) Find a point on the graph of y = f(x - 2);

(b) Find a point on the graph of y = f(x) - 2;

(c) Find a second point on the graph of f assuming that f(x) is symmetric with respect to the *y*-axis;

(d) Find a second point on the graph of f assuming that f is an odd function.

\* - for participation grade 4, please select ONE of these two problems to present to me on the board in my office (Little 457). You may prepare notes to help you, but you should be able to explain on your own (without help from me or another student) how to graph the function. This can be done during office hours on Wednesday, October 21 or Friday, October 23, or by scheduling a different time with me. Please complete this by Friday, October 23.

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Answers:



3. (a) y-axis; (b) x-axis, y-axis, and origin; (c) origin; (d) none of these.

- 4. (a) odd; (b) even; (c) neither.
- 6. (a) (0,3); (b) (-2,1); (c) (2,3); (d) (2,-3).

