

# MATH 150 - WEEK-IN-REVIEW 3

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## PROBLEM STATEMENTS

1. Determine whether each equation represents  $y$  as a function of  $x$ .

(a)  $y - 1 = 4x$

(b)  $x = |2y - 1|$

(c)  $2x^3 + y^2 = 4$

(d)  $y^3 - 4x = 6$

2. Consider the function

$$h(x) = \begin{cases} -2x + 4 & , \text{ if } x \leq -1 \\ (x - 2)^2 & , \text{ if } x > -1. \end{cases}$$

Find  $h(-2)$ ,  $h(-1)$ , and  $h(2)$ .

3. Find the domain of the following functions.

(a)  $f(x) = -3x^2 + 5$

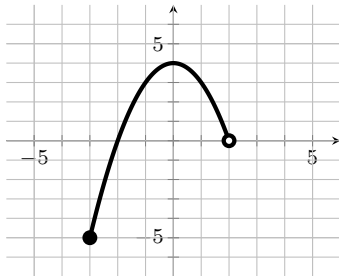
(b)  $g(x) = \sqrt{4 - 3x}$

(c)  $p(x) = \frac{x - 1}{\sqrt{x + 4}}$

(d)  $q(x) = \sqrt[3]{4 - 3x}$



4. Use the graph of the function  $f$  below to find its domain and range, then find the function values  $f(-1)$ ,  $f(2)$ , and  $f(4)$ .



5. Determine whether the function is even, odd, or neither. Then describe the symmetry.

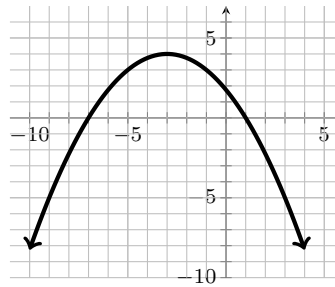
(a)  $f(x) = x\sqrt[3]{x^4 + 1}$

(b)  $g(x) = \frac{x^4 - 9}{x^2 + 9}$

(c)  $h(x) = x^3 - 3x^2$



6. The graph of a function  $g$  is given below.



- Identify the parent function  $f$ .
- Describe the sequence of transformations from  $f$  to  $g$ .
- Find the function  $g$ .
- Use function notation to write  $g$  in terms of  $f$ .

7. Consider the function  $g(x) = 2\sqrt{-x + 3} - 4$ .

- Identify the parent function  $f$ .
- Describe the sequence of transformations from  $f$  to  $g$ .
- Use function notation to write  $g$  in terms of  $f$ .
- Sketch the graph of  $g$ .

**Exam 1 Review**

1. Let  $L_1$  be the line passing through the points  $(2, -1)$  and  $(1, 5)$ , and  $L_2$  be the line passing through the points  $(1, 4)$  and  $(9, 8)$ . Determine whether the lines are parallel, perpendicular, or neither.

2. Solve the inequality  $|9 - 2x| - 2 < -1$ .

3. Write the following expression in reduced form, find where the expression = 0, and include the restrictions of the function.

$$\frac{x^4 + 2x}{5x^2 + x}$$

4. Rationalize the denominator of the expression  $\frac{2}{\sqrt{10} - 2}$  and simplify your answer.



5. Simplify each expression.

a)  $243^{-4/5}$

b)  $(2x + 3)^{-7/2}(2x + 3)^{2/3}$

c)  $(x^4y^2)^{1/3}(xy)^{-1/3}$

d)  $\frac{(7x^5)^{6/5}}{7^{1/5}x^7}$



e)  $\sqrt{12x^2y^{-4}}$

f)  $5\sqrt{50x^2} + 2\sqrt{8x^2}$

6. Solve the quadratic equation  $12x^2 + 12x = 3$  by completing the square.

7. Solve the equation  $3x + 9 = 2x^2 - 2$ .

8. Solve the equation. Check for extraneous solutions.

$$\frac{12}{x^2 + 2x - 3} = \frac{3}{x - 1} + \frac{7}{x + 3}$$

9. For  $z_1 = 2 + 3i$  and  $z_2 = 4 - i$ , find  $z_1 + z_2$ ,  $z_1 - z_2$ ,  $z_1 \cdot z_2$ , and  $\frac{z_1}{z_2}$ .





10. Consider the function  $g(x) = -\frac{1}{3}(x + 2)^3 + 4$ .

a) Identify the parent function  $f$ .

b) Describe the sequence of transformations from  $f$  to  $g$ .

c) Use function notation to write  $g$  in terms of  $f$ .

d) Graph the function.

