## Math 150 - Week-In-Review 1 $_{\rm Sana\ Kazemi}$

## PROBLEM STATEMENTS

1. Consider the function

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

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



2. Find an equation of the line through the points (3,9) and (-7,1) in standard form.

3. Find an equation of the line through the points (3, 9) and (3, -2).

4. Find an equation of the line through the points (3,9) and (-1,9).

5. Write an equation of a line a) parallel to and b) perpendicular to the line 5 + x - 2y = 0 and passing through the point (4, -3) in slope-intercept form.



6. Solve the following inequalities. Graph their solution set.

(a) 
$$\frac{x}{2} - \frac{3}{5} \le \frac{1 - 2x}{10}$$

(b) 
$$-5 \le \frac{1-4x}{2} < 7$$

(c) 
$$|3x - 1| < 11$$



7. Simplify the following expression. Write your answer so that each variable appears at most once, and all exponents are positive.

$$\frac{15(xy^{-1})^2(x^{-2}y^2)^3}{5(x^{-1/2})^4(xy^{-3})^{-2}}$$

8. Simplify each radical expression.

(a) 
$$\sqrt[3]{\frac{16x^4y^2z^4}{-27x^2y^5}}$$

(b) 
$$\sqrt{x^3} + \sqrt{4x^3} - \sqrt{8x}$$



9. Rationalize the denominator.

(a) 
$$\frac{5-z}{\sqrt{5}+\sqrt{z}}$$

(b) 
$$\frac{5\sqrt{3} - 3\sqrt{2}}{2\sqrt{3} + 3\sqrt{2}}$$

10. Simplify the following expression. Leave answer with rational exponents.

$$\left(\frac{a^{5/4}\cdot a^{-1/8}}{a^{1/4}}\right)^{8/3}$$



11. Factor each expression. (a)  $x^2y^2 - 10xy + 25$ 

(b) 
$$4y^2 - 4y - 3$$

(c) 
$$(x+2)(x^2-8) + (x+2)^2(x-1)$$

12. Find the domain of each expression. (a)  $f(x) = x^2 - 10x + 18$ 

(b) 
$$\frac{7x+1}{9x^2-3}$$

(c) 
$$\frac{\sqrt{1-2x}}{x^2-5x}$$

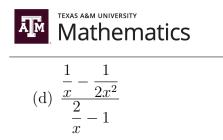


13. Perform the operations and simplify.

(a) 
$$\frac{2x^2 - 5x - 3}{6x^2 + 3x} \cdot \frac{3x^2 + 12x - 15}{x^2 + 2x - 15}$$

(b) 
$$\frac{x^2 + 5x - 14}{x^2 + 8x + 7} \div \frac{x^2 - x - 2}{x - 3}$$

(c) 
$$\frac{x+2}{x^2-2x-8} - \frac{x-2}{x^2-4}$$



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

(a) 
$$f(x) = \frac{x(x^2 - 1)}{5x^4 + 1}$$

(b) 
$$g(x) = \sqrt[3]{x^2 - 1}$$

(c) 
$$h(x) = \frac{x^3 - 1}{x^4 + 2}$$



15. If  $h(x) = \frac{3x}{2} + 1$  evaluate the following: (a) h(a)

(b) h(a+b)

(c) 
$$\frac{h(a+b) - h(a)}{b}$$