

Math 195 Quiz 8B

March 18, 2019

Name: ANSWERS

Instructions: No calculators! Answer all problems in the space provided! Do your rough work on scrap paper.

1. Complete the following rules:

(a)  $x^a \cdot x^b = x^{a+b}$  (b)  $x^{a/b} = \sqrt[b]{x^a}$  (c)  $x^{-n} = \frac{1}{x^n}$  (d)  $\frac{x^a}{x^b} = x^{a-b}$

(e)  $a^2 - b^2 = (a-b)(a+b)$  (f)  $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

2. Suppose  $m_1$  and  $m_2$  are the slopes of two non-vertical lines. What is the relationship between their slopes if:

(a) They are parallel:  $m_1 = m_2$  (b) They are perpendicular:  $m_1 \cdot m_2 = -1$  or  $m_1 = -\frac{1}{m_2}$

3. Suppose  $(x_1, y_1)$  and  $(x_2, y_2)$  lie on a straight line. For this line:

(a) Write down the *slope-intercept form* equation of the line:  $y = mx + b$

(b) Write down the *point-slope form* equation of the line:  $y - y_1 = m(x - x_1)$

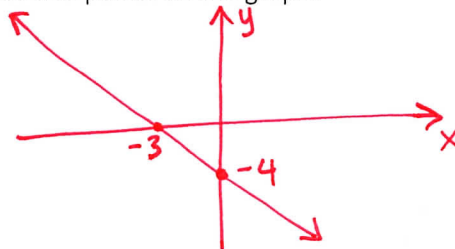
(c) Write an equation that gives its slope:  $m = \frac{y_2 - y_1}{x_2 - x_1}$

4. Find the equation of the line that passes through  $(3, -1)$  having the following features:

(a) Slope = 3:  $y + 1 = 3(x - 3)$  or  $y = 3x - 10$  (b) vertical:  $x = 3$

(c) Horizontal:  $y = -1$  (d) perpendicular to  $2x + 3y = 1$ :  $y + 1 = \frac{3}{2}(x - 3)$  or  $y = \frac{3}{2}x - \frac{11}{2}$

5. Graph  $4x + 3y = -12$ , indicate two points on the graph:



6. Identify the given functions as "odd", "even" or "neither" by filling out the table. Also state what kind of symmetry the function has. If it is neither even nor odd, enter "N/A" in the symmetry column.

Function	Odd/Even/Neither?	Symmetric about...?
$f(x) = \frac{x}{x^5 + x}$	Even	y-axis ( $x=0$ )
$f(x) = 2x^5 - 3x^3 + x$	Odd	origin
$f(x) = 2x - x^2$	Neither	N/A

Bonus (after attempting the problems above, do these for extra credit):

1. Let  $f(x) = \begin{cases} 1 + x^2, & x \leq 0 \\ 2 + 3x, & 0 < x < 2 \\ 7, & 2 \leq x < 4 \\ 1 - x, & x > 4 \end{cases}$ . Evaluate  $f(x)$  at the indicated  $x$ -values:

(a)  $f(3) = 7$  (b)  $f(4) = \text{undefined}$  (c)  $f(5) = -4$