

Math 195 Quiz 8A

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

(e) $x^2 - y^2 = (x-y)(x+y)$ (f) $x^3 - y^3 = (x-y)(x^2 + xy + y^2)$

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

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

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

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

3. 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 $m_1 = -\frac{1}{m_2}$

4. 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.

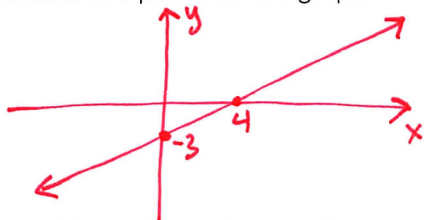
Function	Odd/Even/Neither?	Symmetric about...?
$f(x) = 3x - x^2$	Neither	N/A
$f(x) = \frac{x^2}{1-x^4}$	Even	y-axis ($x=0$)
$f(x) = x - 3x^3 + 7x^7$	Odd	origin

5. Find the equation of the line that passes through $(2, -3)$ having the following features:

(a) Slope = 3: $y + 3 = 3(x - 2)$ or $y = 3x - 9$ (b) vertical: $x = 2$

(c) Horizontal: $y = -3$ (d) perpendicular to $2x + 3y = 1$: $y + 3 = \frac{3}{2}(x - 2)$ or $y = \frac{3}{2}x - 6$

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



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

1. Let $f(x) = \begin{cases} 1 - x^2, & x \leq -1 \\ 2 + x, & -1 < x < 3 \\ 3, & 3 \leq x < 5 \\ x + 1, & x > 5 \end{cases}$. Evaluate $f(x)$ at the indicated x -values:

(a) $f(-2) = -3$ (b) $f(4) = 3$ (c) $f(5) = \text{undefined}$