

Math 95
Final Review (Version 1)

1. Evaluate using the appropriate order of operations.

$$3 \cdot 2 - (4 + 4 \cdot 3)^{\frac{1}{2}}$$

- a. $6 - \sqrt{24}$ b. 10 c. 2 d. 5

2. Solve for c : $2(c + 3) = -(c - 2) + 1$

- a. $c = -3$ b. $c = -7$ c. $c = -\frac{7}{3}$ d. $c = -1$

3. Simplify the expression by using the properties of exponents. Write the final answer using only positive exponents.

$$\left(\frac{81s^{12}r^{-4}}{16s^{-4}r^4} \right)^{\frac{3}{4}}$$

- a. $\frac{27s^6}{8}$ b. $\frac{3s^{16}r^8}{2}$ c. $\frac{3s^{12}}{2r^6}$ d. $\frac{27s^{12}}{8r^6}$

4. Simplify $\left(\frac{-2x^2y^{-1}}{4x^{-2}y^2} \right)^0$

- a. $\frac{-1x^4}{2y^3}$ b. 0 c. $\frac{-1}{2y}$ d. 1

5. Simplify $2^2 - 2^{-1}$

- a. 2 b. $\frac{3}{2}$ c. $\frac{7}{2}$ d. 6

6. If $f(x) = 2x^2 - 7x + 6$, evaluate $f(-1)$

- a. -3 b. 15 c. 1 d. 11

7. Determine the equation of the line containing the points $(4, -5)$ and $(7, 1)$.

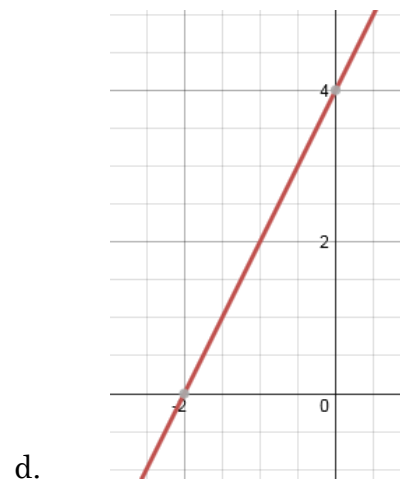
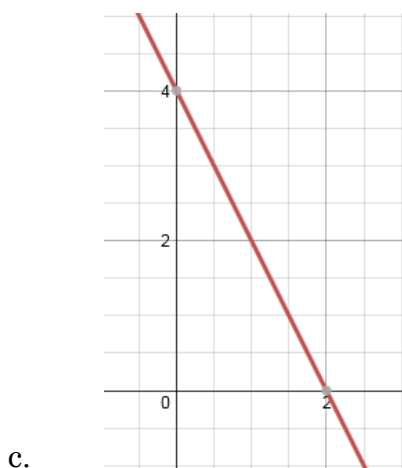
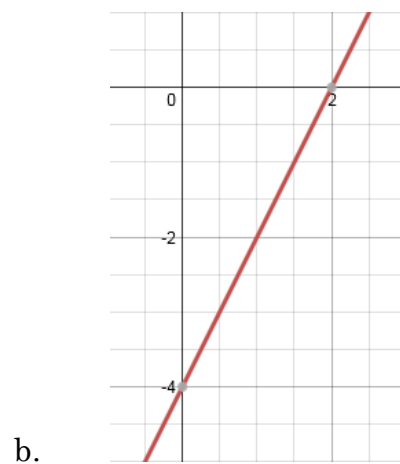
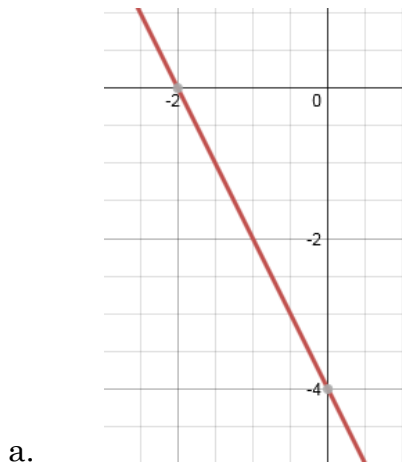
- a. $y = 2x - 13$ b. $y = -6x + 1$ c. $y = \frac{1}{2}x - 7$ d. $y = -\frac{1}{6}x - \frac{13}{3}$

8. Determine whether the two lines are parallel, perpendicular, or neither.

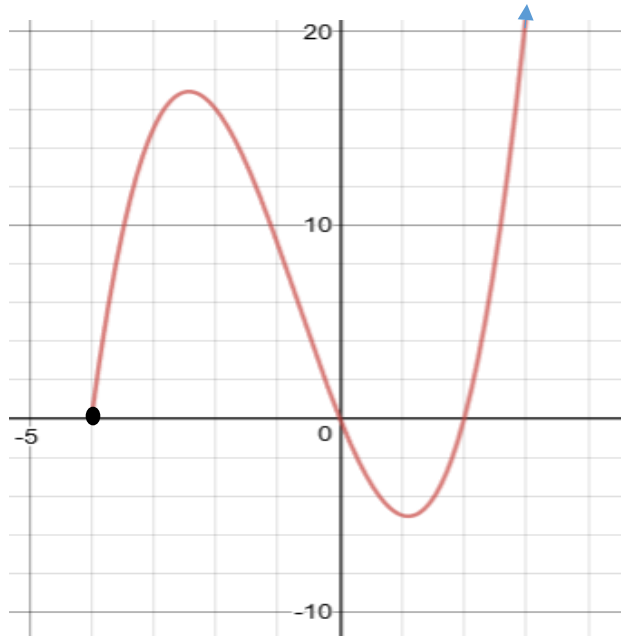
$$y = 3x - 5 \quad \text{and} \quad 3y + x = 12$$

- a. Parallel b. Perpendicular c. Neither d. Not Enough Information

9. Determine the graph for the given equation: $6x + 3y = 12$

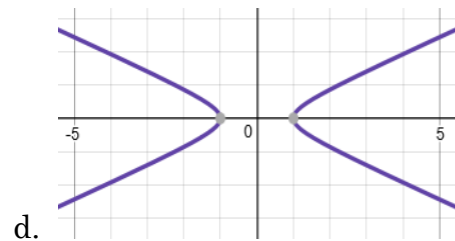
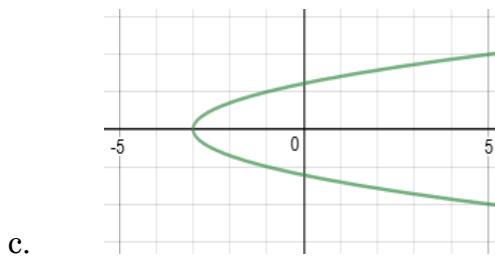
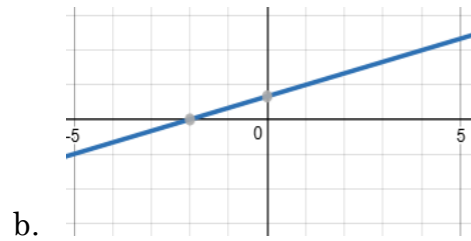
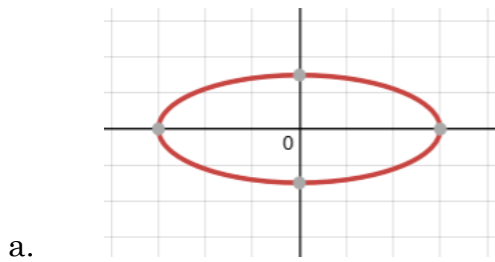


Use the following graph for problems 10 – 12.



10. Find the domain and range of $f(x)$.
- | | | | | | |
|----|---------|---------------------|----|---------|----------------|
| a. | Domain: | $(-\infty, \infty)$ | b. | Domain: | $[-4, \infty)$ |
| | Range: | $(-\infty, \infty)$ | | Range: | $[-5, \infty)$ |
| c. | Domain: | $[-5, \infty)$ | d. | Domain: | $(-4, \infty)$ |
| | Range: | $[-4, \infty)$ | | Range: | $(-5, \infty)$ |
11. Evaluate $f(0)$.
- | | | | | | | | |
|----|----|----|---|----|----------|----|---|
| a. | -4 | b. | 2 | c. | -4, 0, 2 | d. | 0 |
|----|----|----|---|----|----------|----|---|
12. Find the values of x for which $f(x) = 0$.
- | | | | | | | | |
|----|----------|----|---------|----|----------------|----|-------------|
| a. | $x = -4$ | b. | $x = 0$ | c. | $x = -4, 0, 2$ | d. | $x = -4, 2$ |
|----|----------|----|---------|----|----------------|----|-------------|
13. Find the domain of $f(x)$ if $f(x) = \frac{x^2-9}{x+3}$
- | | | | | | | | |
|----|----------------|----|--------------|----|------------|----|-------------|
| a. | $x \neq -3, 3$ | b. | All Real #'s | c. | $x \neq 3$ | d. | $x \neq -3$ |
|----|----------------|----|--------------|----|------------|----|-------------|
14. Find the domain of $f(x)$ if $f(x) = \frac{x}{\sqrt{2-x}}$
- | | | | | | | | |
|----|----------------|----|----------------------------|----|---------------|----|----------------|
| a. | $(-\infty, 2]$ | b. | $(-\infty, 0) \cup (0, 2]$ | c. | $[2, \infty)$ | d. | $(-\infty, 2)$ |
|----|----------------|----|----------------------------|----|---------------|----|----------------|

15. Which graph *represents* a function?



16. Find the x and y intercepts and the slope of the line: $2y = 3x + 12$

a. x-intercept: $(-4, 0)$
y-intercept: $(0, 6)$
slope (m) = $\frac{3}{2}$

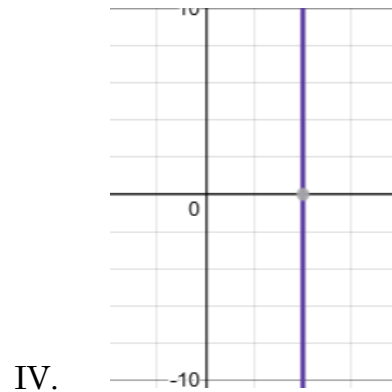
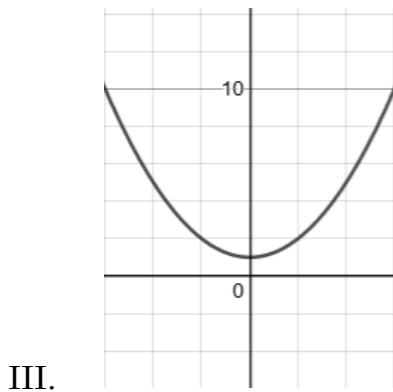
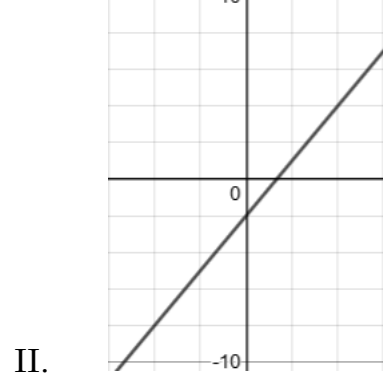
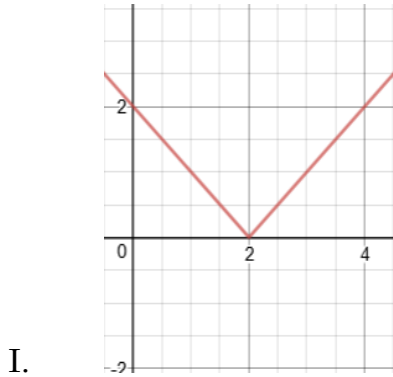
b. x-intercept: $(0, -4)$
y-intercept: $(6, 0)$
slope (m) = $\frac{3}{2}$

c. x-intercept: $(6, 0)$
y-intercept: $(0, 4)$
slope (m) = $\frac{2}{3}$

b. x-intercept: $(-4, 0)$
y-intercept: $(0, 6)$
slope (m) = $\frac{2}{3}$

17. Match the equation type with the appropriate graph.

Eqtn. Types: Vertical Line, Line with a slope, Parabolic, Absolute Value



- a. I – Line w/ slope, II – Absolute Value, III – Parabolic, IV – Vertical Line
- b. I – Absolute Value, II – Line w/ slope, III – Parabolic, IV – Vertical Line
- c. I – Vertical Line, II – Line w/ slope, III – Absolute Value, IV – Parabolic,
- d. None of the above

18. Solve the system: $x + y = 0$
 $3x - 2y = 10$

- a. (-2, 2) b. (2, -2) c. (-13, 13) d. (-5, 5)

19. Solve the system:
$$\begin{aligned} -2x + 3y &= -9 \\ 6x - 9y &= -27 \end{aligned}$$

- a. $(-3, 9)$ b. No Solution c. $(0, 0)$ d. $\{(x, y) \mid 2x - 3y = 9\}$

20. Solve the inequality and state the answer in set builder notation:

$$3(x - 2) \geq 9(x + 2)$$

- a. $\{x \mid x \leq -4\}$ b. $\{x \mid x \geq 4\}$
c. $\{x \mid x < -4\}$ d. $\{x \mid x \leq -2\}$

21. Solve the compound inequality:
$$\frac{x}{3} - 2 \geq 1 \quad \text{or} \quad 5 + \frac{3}{4}x \leq -4$$

- a. $[-12, 9]$ b. $(-\infty, -3) \cup (3, \infty)$ c. $(-\infty, -12] \cup [9, \infty)$ d. $(-\infty, \infty)$

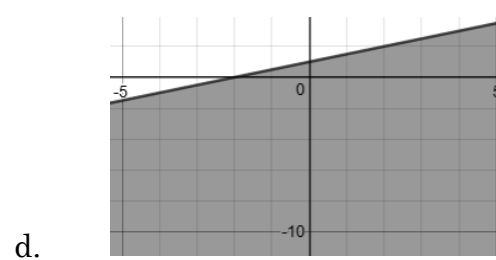
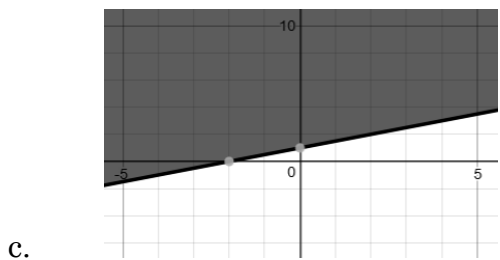
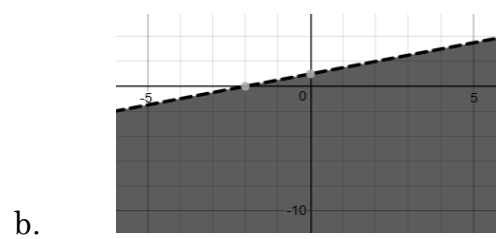
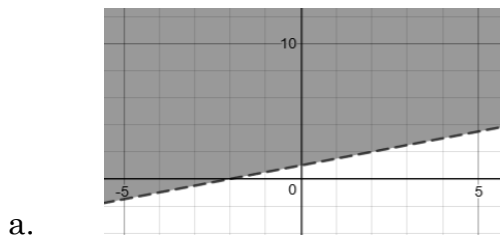
22. Solve the absolute value equation:
$$|6x - 4| - 13 = -3$$

- a. $x = -1, \frac{7}{3}$ b. $x = \frac{5}{3}, \frac{7}{6}$ c. $x = 0, \frac{4}{3}$ d. No Solution

23. Solve the absolute value inequality:
$$-4|2x - 7| > -12$$

- a. $(-\infty, 2) \cup (5, \infty)$ b. $(-\infty, -5) \cup (-2, \infty)$ c. $(2, 5)$ d. No Solution

24. Graph the following inequality: $y \geq \frac{1}{2}x + 1$



25. Subtract: $-4x^2 + 2x - (-5x^2 + 2x + 3)$

a. $-9x^2 - 3$

b. $-9x^2 + 4x - 3$

c. $x^2 - 3$

d. $x^2 + 3$

26. Multiply: $(3t - 4)(2t + 3)$

a. $5t^2 - 12$

b. $6t^2 + 17t - 12$

c. $6t^2 + t - 12$

d. $6t^2 + t + 12$

27. Multiply: $(2a + 5)(a^2 - 3a + 2)$

a. $2a^3 + a^2 - 11a + 10$

b. $2a^3 - a^2 - 11a + 10$

c. $a^2 - 11a + 10$

d. $2a^3 - 11a^2 - 9a + 10$

28. Factor completely: $5t^2 - 21t + 18$

a. $(t - 3)(5t - 6)$

b. $(5t - 3)(t - 6)$

c. $(t + 3)(5t + 6)$

d. Does not factor

29. Factor completely: $16a^2 - 81b^2$

a. $(4a - 9b)(4a - 9b)$

b. $(4a + 9)(4a - 9)$

c. $(4a + 9b)(4a - 9b)$

d. $(16a + 81b)(16a - 81b)$

30. Multiply and Simplify, if possible: $\frac{4v-8}{5v} \cdot \frac{15v^2}{4v^2-16v+16}$

a. $-\frac{60v^3}{20v^3-80v^2+80v}$

b. $\frac{3v^2}{v^2-2v}$

c. $\frac{3v}{v+2}$

d. $\frac{3v}{v-2}$

31. Divide by using synthetic division: $\frac{2x^2+11x-5}{x+6}$

a. $2x - 1 + \frac{1}{x+6}$

b. $2x + 1 + \frac{1}{x+6}$

c. $2x - 1 - \frac{1}{x+6}$

d. $2x^2 + 11 - \frac{5}{6}$

32. Divide by using long division: $(3x^4 + x^3 - 8x^2 - 3x - 3) \div (x^2 - 3)$

a. $3x^2 - 8 - \frac{3x+3}{x^2-3}$

b. $3x^2 + x + 1 - \frac{6}{x^2-3}$

c. $3x^2 + x + 1$

d. $3x^2 + 1$

33. Subtract and Simplify, if possible: $\frac{8p}{p^2-16} - \frac{p}{p-4}$

a. $\frac{p}{p+4}$

b. $\frac{7p}{p^2-p-12}$

c. $-\frac{p}{p-4}$

d. $-\frac{p}{p+4}$

34. Simplify the rational expression: $\frac{\frac{x-8}{8} - \frac{x}{1}}{\frac{1}{8} + \frac{1}{x}}$

a. $x - 8$

b. $x + 8$

c. $\frac{x-8}{x+8}$

d. $\frac{x+8}{x-8}$

35. Solve the rational equation: $\frac{3}{x} + \frac{3}{x-6} = \frac{3x-15}{x-6}$
- a. $x = 1$ b. $x = 1, 6$ c. $x = -\frac{5}{2}, \frac{1}{3}$ d. No Solution
36. Solve for w : $P = 2w + 2l$
- a. $w = P - l$ b. $w = \frac{P-2l}{2}$ c. $w = 2P - l$ d. $w = \frac{P}{2} + l$
37. Solve for x : $\sqrt{5x-6} + 10 = 12$
- a. $x = \frac{8}{5}$ b. $x = 2$ c. $x = 5$ d. $x = -2$
38. Simplify $\sqrt[3]{-125x^4y^6}$
- a. $-5xy^2\sqrt[3]{x}$ b. $5x^2y^3\sqrt{5}i$ c. $-125x^{\frac{4}{3}}y^2$ d. $5xy^2\sqrt[3]{x}i$
39. Express using radical notation and simplify: $x^{\frac{7}{3}}y^{\frac{4}{3}}$
- a. $x^2y\sqrt[3]{xy}$ b. $x^2y^3\sqrt{xy}$ c. $(xy)^{\frac{11}{3}}$ d. $\sqrt[7]{x^3}\sqrt[4]{y^3}$
40. Simplify: $\sqrt[4]{\frac{3x^6}{16y^8x}}$
- a. $\frac{3x\sqrt[4]{x}}{16y^2}$ b. $\frac{x^3}{4y^4}\sqrt{\frac{3}{x}}$ c. $\frac{x^4\sqrt[3]{3x^3}}{2y^2}$ d. $\frac{x^4\sqrt[3]{3x}}{2y^2}$
41. Simplify: $-121^{\frac{1}{2}}$
- a. $11i$ b. -11 c. $-\frac{121}{2}$ d. $\frac{121}{2}i$
42. Simplify: $2\sqrt{12} + 3\sqrt{75} - \sqrt{3}$
- a. $4\sqrt{3}$ b. $18\sqrt{3}$ c. $4\sqrt{84}$ d. $8\sqrt{21}$

43. Multiply: $(3 + \sqrt{x})(4 - 2\sqrt{x})$
 a. $12 - 2x$ b. $6x$ c. $12 - 2\sqrt{x} - 2x$ d. $24x - 12$
44. Rationalize the following denominator: $\frac{\sqrt{3}}{1 - \sqrt{3}}$
 a. $\frac{(3+3\sqrt{3})}{-2}$ b. $-\frac{3\sqrt{3}}{2}$ c. $\frac{(3+\sqrt{3})}{-2+2\sqrt{3}}$ d. $\frac{-(3+\sqrt{3})}{2}$
45. Solve: $2(x + 1)^2 = -32$
 a. $x = -5, 4$ b. $x = -1 \pm 4i$ c. $x = -1 \pm 16i$ d. $x = -17, 15$
46. Solve: $9x^2 + 12x - 45 = 0$
 a. $x = -\frac{5}{3}, 3$ b. $x = -3, 5$
 c. $x = -3, \frac{5}{3}$ d. $x = -3, \frac{3}{5}$
47. Solve: $x^2 - 7x = 18$
 a. $x = 2, -9$ b. $x = 2, 9$ c. $x = -2, 9$ d. $x = -2, -9$
48. Solve $x^2 + 8x - 4 = 0$
 a. $x = -4, 8$ b. $x = -2, -4$ c. $x = -4 \pm 4\sqrt{5}$ d. $x = -4 \pm 2\sqrt{5}$
49. If you were to complete the square for the equation $x^2 + 16x = -20$, what value would you add to both sides of the equation?
 a. 16 b. 8 c. 64 d. -64
50. Find any x intercepts and the y intercept of $f(x) = -x^2 + 4x - 4$
 a. $(2, 0)$ and $(0, -4)$ b. $(-2, 0)$ and $(0, 4)$
 c. $(0, 2)$ and $(-4, 0)$ d. $(2, 0), (-2, 0)$ and $(0, -4)$

Answer Key

- | | | | |
|-----|---|-----|---|
| 1. | C | 26. | C |
| 2. | D | 27. | B |
| 3. | D | 28. | A |
| 4. | D | 29. | C |
| 5. | C | 30. | D |
| 6. | B | 31. | A |
| 7. | A | 32. | C |
| 8. | B | 33. | D |
| 9. | C | 34. | A |
| 10. | B | 35. | A |
| 11. | D | 36. | B |
| 12. | C | 37. | B |
| 13. | D | 38. | A |
| 14. | D | 39. | A |
| 15. | B | 40. | D |
| 16. | A | 41. | B |
| 17. | B | 42. | B |
| 18. | B | 43. | C |
| 19. | B | 44. | D |
| 20. | A | 45. | B |
| 21. | C | 46. | C |
| 22. | A | 47. | C |
| 23. | C | 48. | D |
| 24. | C | 49. | C |
| 25. | C | 50. | A |