

Math 51 – Final Exam Review Exercises Answer Key

Note: Please let me know if you find any mistakes or have any questions! - Prof. Beydler

1.

- a. $\left\{\frac{5}{2}\right\}$
- b. $\{3\}$
- c. \emptyset or $\{\}$
- d. \mathbb{R} or {all real numbers}
- e. $\left\{\frac{13}{7}\right\}$

2.

- a. $h = 3$
- b. $r = 50$

3.

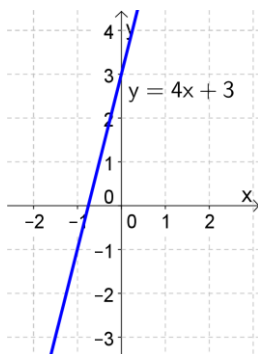
- a. $h = \frac{V}{\pi r^2}$
- b. $W = \frac{P-2L}{2}$
- c. $y = \frac{xz}{x+z}$

4.

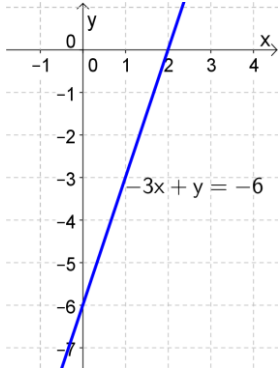
- a. $(-2, \infty)$
- b. $(-\infty, -13]$
- c. $\left(-\frac{16}{3}, 8\right]$

5.

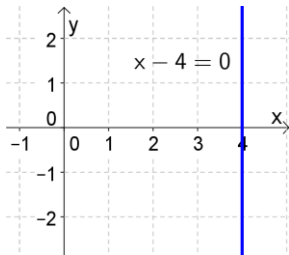
- a. slope: 4, y-intercept: (0,3)



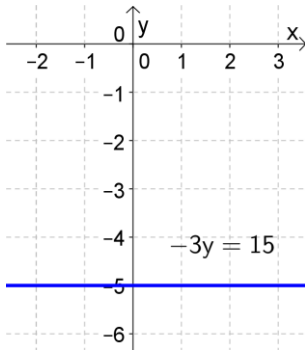
b. slope: 3, y-intercept: $(0, -6)$



c. slope: undefined, y-intercept: none



d. slope: 0, y-intercept: $(0, -5)$



6.

a. $y = -3x - 7$

b. $y = 5x - 2$

c. $y = -3x + 14$

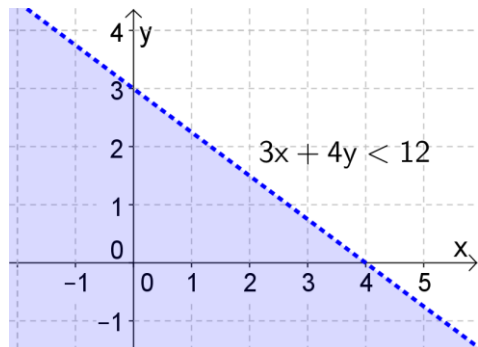
d. $y = \frac{3}{2}x + 5$

e. $x = 3$

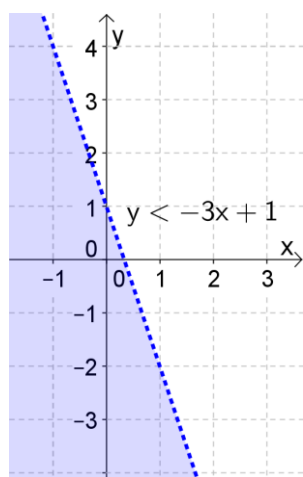
f. $y = -5$

7.

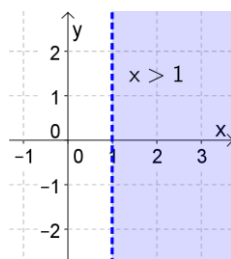
a.



b.



c.



8.

a. $\{(-3, 0)\}$

b. \emptyset

c. $\left\{\left(\frac{1}{2}, 4\right)\right\}$

9.

a. $\frac{1296x^{12}y^{36}}{z^{20}}$

b. $27x^{12}y^{11}z^{23}$

c. $\frac{1}{xyz}$

d. x^3y^9

e. $\frac{y^9}{x^{12}}$

10.

a. $-x^6 + 5x^4 + x^2 - 3$

b. $-2x^2 + 1$

11.

a. $-21x - 35x^3 + 14x^4$

b. $6x^5 + 24x^4 - 4x^3 - 16x^2 + 2x + 8$

c. $-24x^3 + 44x^2 + 40x$

d. $9x^2 - 6x + 1$

e. $25x^2 + 30x + 9$

12.

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

b. $3x^2 - 5x + 6$

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

d. $3x^2 + 5x + 7 + \frac{12x+37}{x^2-5}$

13.

a. $(x + 8)(x + 9)$

b. $(4x + 1)(2x - 3)$

c. prime

d. $(8x + 10y)(8x - 10y)$

e. $(2x + 5)(4x^2 + 10x + 25)$

f. $(2 - x)(2 - 3y)$

g. $4(2x - 3)^2$

h. $(4x + 3y)^2$

i. prime

j. $2x(3x + 4y)(2x - 3y)$

k. $6x(x + 1)(x - 1)$

14.

- a. $\{-1, 3\}$
- b. $\{\frac{2}{3}, 6\}$
- c. $\{0, 2, 4\}$

15.

- a. $\frac{x+2}{x-2}$
- b. $x^2 + 3x + 9$
- c. $\frac{x^2-3x+9}{x-3}$
- d. $-x - y$ or $-(x + y)$
- e. $\frac{y+2x^2}{4x^2y+xy}$ or $\frac{2x^2+y}{xy(4x+1)}$
- f. $\frac{4x+1}{2x+5}$

16.

- a. $\frac{x-2}{2x}$
- b. $\frac{x-3}{2x-3}$
- c. $x + 1$
- d. $\frac{8-x}{x(x-4)(x+4)}$
- e. $\frac{2x^2+5x+12}{(x+4)^2(x-4)}$

17.

- a. $\{-7\}$
- b. $\{3\}$
- c. \emptyset or $\{\}$
- d. $\{-\frac{6}{7}, 3\}$

18.

- a. $-\frac{9}{10}$
- b. not a real number (or undefined)
- c. 4
- d. -4

19.

- a. $4\sqrt{5}$
- b. $2\sqrt{14}$
- c. $3\sqrt{5}$
- d. $6x^2y^4z\sqrt{2x}$
- e. $7x^3y$

20.

- a. $58\sqrt{3}$
- b. $(1 + 6x)\sqrt{5x}$
- c. $20\sqrt{15}$
- d. $5x^5\sqrt{3}$
- e. $x\sqrt{5x}$
- f. $2 + 5\sqrt{35}$

21.

- a. $\sqrt{2}$
- b. $3 + \sqrt{3}$
- c. $\frac{5^3\sqrt{3}}{3}$
- d. $\frac{2\sqrt{10}}{3}$
- e. $\frac{15-3\sqrt{6}-5\sqrt{2}+2\sqrt{3}}{19}$

22.

- a. {1}
- b. {6}
- c. {3}
- d. $\left\{\frac{1}{5}\right\}$
- e. {2}
- f. \emptyset or {}
- g. {4}

23.

- a. 9

- b. -5
- c. 32
- d. 243
- e. $x^{3/4}$

24.

- a. $\{5, -11\}$
- b. $\left\{-\frac{3}{4} + \frac{\sqrt{3}}{2}, -\frac{3}{4} - \frac{\sqrt{3}}{2}\right\}$

25.

- a. $\{-13, 1\}$
- b. $\{2\}$
- c. $\left\{-3 + \frac{\sqrt{26}}{2}, -3 - \frac{\sqrt{26}}{2}\right\}$
- d. $\{0, -1\}$
- e. $\left\{-\frac{5}{2} + \frac{\sqrt{61}}{2}, -\frac{5}{2} - \frac{\sqrt{61}}{2}\right\}$

26. $f(2) = 6, f(0) = 2, f(-3) = 41$

27. 6

28. 7, 8

29. 6 ft, 10 ft, and 12 ft

30. $25\frac{2}{3}$ in.31. $13\frac{1}{3}$ L

32. 4 L

33. 40 lbs nuts, 20 lbs raisins

34. 50 km per hr, and 65 km per hr

35. $x^2 + 7x - 25$

36. length: 8 ft; width: 5 ft

37. 9 in., 12 in., 15 in.

38. 16 km per hr

39. $5\frac{1}{3}$ days

40. $3\frac{3}{7}$ hours