

Math 0308 Final Exam Review-Revised Spring 2018

Solve the given equations.

1. $3x + 14 = 8x - 1$

2. $3(4x - 1) = 5x + 6$

3. $8 - (3x + 4) = 6x$

4. $\frac{3}{2}x - 1 = \frac{1}{8}(12x - 8)$

5. $\frac{1}{12}(4x - 3) = \frac{1}{4}(2x + 1)$

6. $2(3x + 1) - 4(2x - 2) = 2(7x - 3)$

7. $3x + 14 = 5(x - 2) - 2(x + 7)$

Solve the following inequalities. Graph your solution on a number line.

8. $x - 7 \leq -4$

9. $4x + 9 > 3$

10. $1 - 9x \geq 4$

11. $2x + 15 > 7x - 1$

12. $3x + 8 \leq 7x - 4$

13. $-2 \leq 4x + 1 \leq 5$

14. $-1 < 3x + 8 \leq 5$

15. $-7x - 8 < 6$

16. $-4x + 5 > -19$

Write an algebraic equation to represent each sentence. Then solve the equation by showing all steps.

17. Find two consecutive odd integers whose sum is -24 .

18. Find three consecutive integers whose sum is 39.

19. Twice the sum of a number and negative two is sixteen. Find the number.

20. The perimeter of a rectangle is 36 feet. The length is 2 feet more than 3 times the width. What are the dimensions of the rectangle?

21. The sum of six times a number and ten is equal to the difference of the number and fifteen. Find the number.

22. The perimeter of a rectangle is 64 feet. The length is 7 feet less than two times the width. What are the dimensions of the rectangle?

Using the laws of exponents, simplify the following expressions. Write your answers with positive exponents. Assume that all variables represent non-zero numbers.

23. $(x^4)^6$

24. $\left(\frac{3x^4}{y^8}\right)^3$

25. $\frac{39x^5y^{12}}{3x^4y^6}$

26. $(2x^0y^3)^3$

27. $(x^2y^5)^{-3}$

28. $(x^{-4}y^3)^{-4}$

29. $\frac{14x^{-2}y^6}{21x^{-10}y^{-3}}$

30. $\frac{-9x^2y^{-8}}{12x^4y^{-4}}$

Perform the indicated operations, and simplify all answers.

31. $(x^2 - 5x - 12) + (7x^2 - 3x + 4)$ **32.** $(5x^2 - x + 6) - (x^2 - 8x - 2)$

33. $(3x + 8)(6x - 5)$

34. $(x - 11y)(x + 11y)$

35. $\frac{24x^5yz + 6x^4y^2z^3 - 4x^3y^3z^5}{3x^4yz^2}$

36. $\frac{12xz^3 - 40x^5z + 8x^2z}{8x^2z}$

37. $\frac{2x^3 + 13x^2 + 21x + 7}{x + 4}$

38. $\frac{12x^3 + 5x^2 - 34x + 10}{4x - 1}$

Completely factor the following polynomials.

39. $x^2 + 11x + 24$

40. $x^2 - 81$

41. $x^2 - 9x + 14$

42. $25u^3v^2 - 15uv^7$

43. $x^2 + 6x + 8$

44. $x^2 + 11x + 28$

45. $x^2 - 6x - 27$

46. $6x^2 - 11x - 2$

47. $5x^2 + 7x - 6$

48. $2xy + 4x^3y$

49. $6xy + 21x + 10y + 35$

50. $6xy + x - 30y - 5$

51. $12x^3 - 28x^2 - 3x + 7$

Solve the given equations.

52. $10x^2 - 8x = 0$

53. $x^2 + 5x = 24$

54. $3x^2 + 19x + 6 = 0$

55. $9x^2 - 5x = 0$

56. $x^2 + 6x - 15 = 2(x + 3)$

57. $x^2 + 5x - 18 = 3(x - 1)$

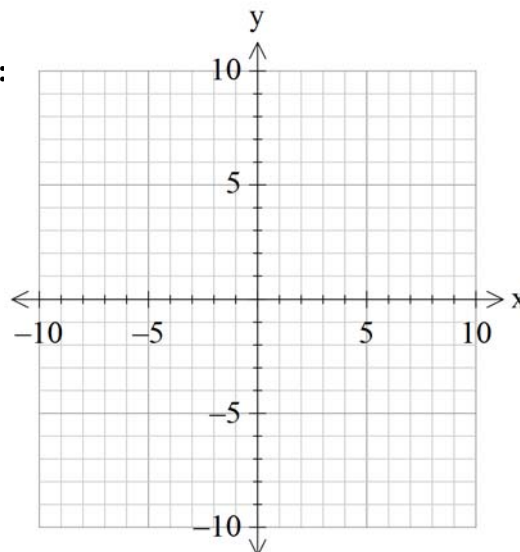
58. Plot the points on the given rectangular coordinate system:
Label the points on the grid as A, B, C, and D

$A(4, -3)$

$B(-5, 0)$

$C(-3, -6)$

$D(-5, 4)$



Given the following linear equations, complete the table of solution pairs.

59. $6x - 5y = 10$

Complete the table.

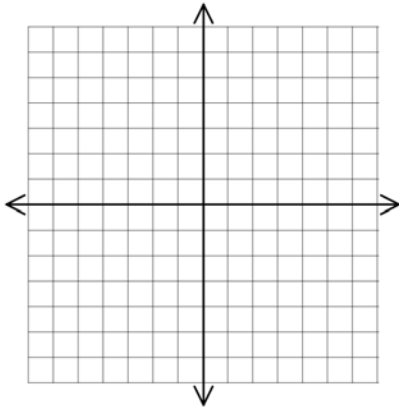
x	y
0	
	0
	2

60. $3x - 4y + 9 = 0$

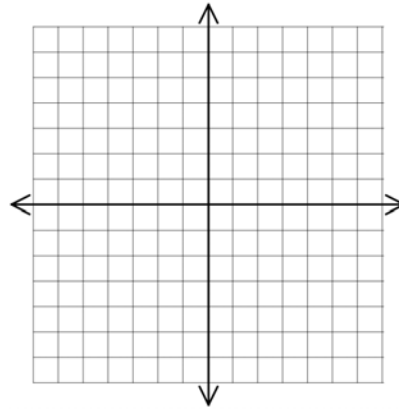
x	y
-3	
	1
5	

Find the x- and y- intercepts and then graph the following lines.

61. $-x - 2y = 6$

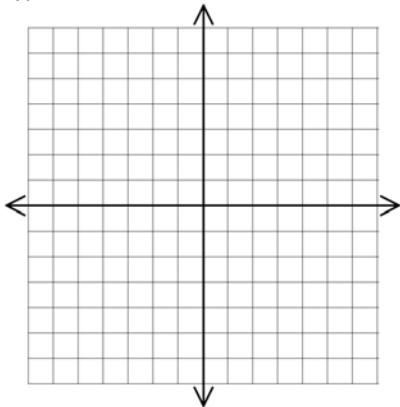


62. $5x - 4y = 20$

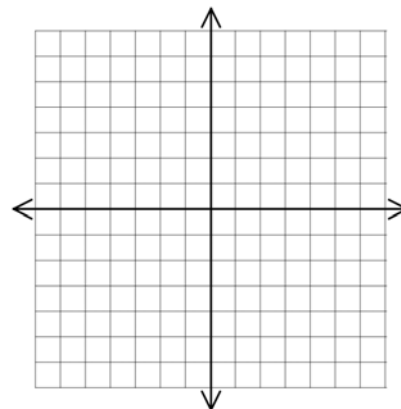


Graph the following lines:

63. $x = 2$



64. $3y + 6 = 0$



Find the slope of the line that passes through the given pair of points.

65. $(-2,4)$ $(1,5)$

66. $(1,-3)$ $(4,2)$

67. $(2,4)$ $(2,-3)$

68. $(1,-3)$ $(4,-3)$

Find the slope and y-intercept for the following linear equation.

69. $7x - 9y = 18$

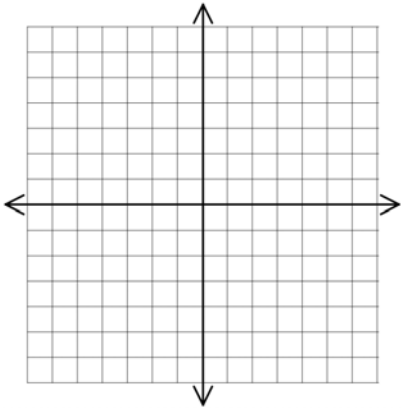
70. $2x + 5y = 15$

Find an equation for the line described. Write your answer in slope-intercept form.

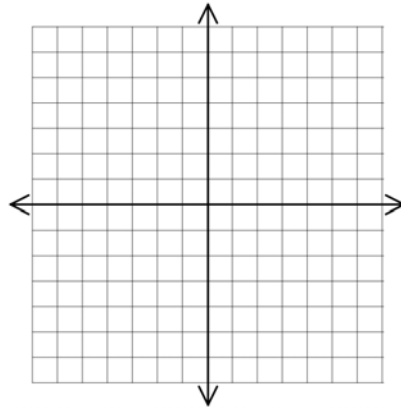
71. $m = \frac{3}{5}$; y-intercept = -2

72. $m = \frac{-2}{7}$; y-intercept = $\frac{1}{2}$

73. Through the point $(0, 5)$, having slope of $\frac{-3}{2}$



74. Through the point $(0, -4)$, having slope of $\frac{1}{4}$



Determine the solutions of the following linear systems of equations. If there are no solutions, write *inconsistent*. If there are infinitely many solutions, write *dependent*.

75.
$$\begin{aligned} 5x - 4y &= 33 \\ x &= 3y \end{aligned}$$

76.
$$\begin{aligned} y &= -3x + 12 \\ 9x + 2y &= 15 \end{aligned}$$

77.
$$\begin{aligned} 3x + 2y &= -10 \\ 2x + 5y &= -14 \end{aligned}$$

78.
$$\begin{aligned} -5x + 2y &= -11 \\ -6x - 5y &= -28 \end{aligned}$$

79. $2x - 6y = 4$
 $-x + 3y = -2$

80. $6x - 4y = 10$
 $-3x + 2y = -4$

Solve the following proportions.

81. $\frac{x}{3} = \frac{5}{11}$

82. $\frac{x+2}{5x} = \frac{-3}{7}$

Set up a proportion and solve the following:

83. A cookie recipe calls for $\frac{1}{3}$ cup of flour for 12 cookies. How many cups of flour are needed to prepare 30 cookies?

84. A car can drive 132 miles on the highway on 4 gallons of gas. At this rate, how many miles can the car drive on 9 gallons of gas?

ANSWERS

1. $\{3\}$

2. $\left\{\frac{9}{7}\right\}$

3. $\left\{\frac{4}{9}\right\}$

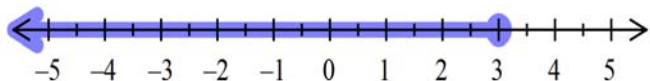
4. All real numbers

5. $\{-3\}$

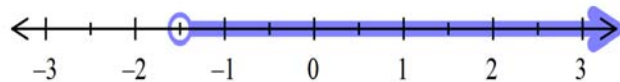
6. $\{1\}$

7. No Solution or \emptyset

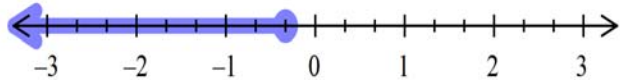
8. $x \leq 3$



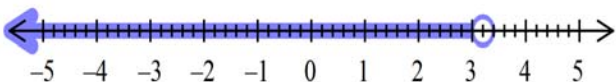
9. $x > \frac{-3}{2}$



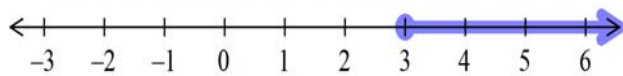
10. $x \leq \frac{-1}{3}$



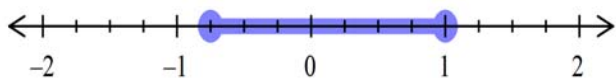
11. $x < \frac{16}{5}$



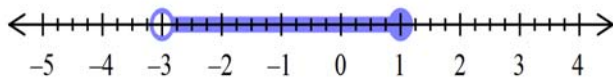
12. $x \geq 3$



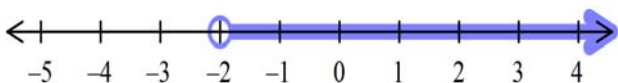
13. $\frac{-3}{4} \leq x \leq 1$



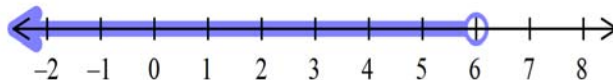
14. $-3 < x \leq 1$



15. $x > -2$



16. $x < 6$



17. $-11, -13$

18. $12, 13, 14$

19. 10

20. $4 \text{ ft}, 14 \text{ ft}$

21. -5

22. $13 \text{ ft}, 19 \text{ ft}$

23. x^{24}

24. $\frac{27x^{12}}{y^{24}}$

25. $13xy^6$

26. $8y^9$

27. $\frac{1}{x^6y^{15}}$

28. $\frac{x^{16}}{y^{12}}$

29. $\frac{2x^8y^9}{3}$

30. $\frac{-3}{4x^2y^4}$

31. $8x^2 - 8x - 8$

32. $4x^2 + 7x + 8$

33. $18x^2 + 33x - 40$

34. $x^2 - 121y^2$

35. $\frac{8x}{z} + 2yz - \frac{4y^2z^3}{3x}$

36. $\frac{3z^2}{2x} - 5x^3 + 1$

37. $2x^2 + 5x + 1 + \frac{3}{x+4}$

38. $3x^2 + 2x - 8 + \frac{2}{4x-1}$

39. $(x+3)(x+8)$

40. $(x+9)(x-9)$

41. $(x-7)(x-2)$

42. $5uv^2(5u^2 - 3v^5)$

43. $(x+2)(x+4)$

44. $(x+4)(x+7)$

45. $(x+3)(x-9)$

46. $(6x+1)(x-2)$

47. $(5x - 3)(x + 2)$

48. $2xy(1 + 2x^2)$

49. $(2y + 7)(3x + 5)$

50. $(6y + 1)(x - 5)$

51. $(3y - 7)(2x + 1)(2x - 1)$

52. $\left\{0, \frac{4}{5}\right\}$

53. $\{-8, 3\}$

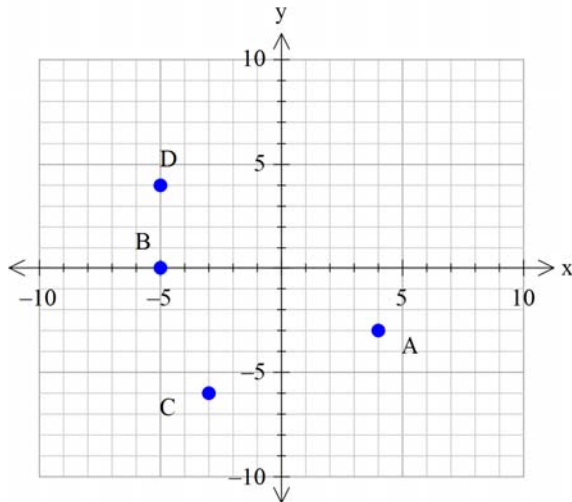
54. $\left\{-\frac{1}{3}, -6\right\}$

55. $\left\{0, \frac{5}{9}\right\}$

56. $\{-7, 3\}$

57. $\{-5, 3\}$

58.



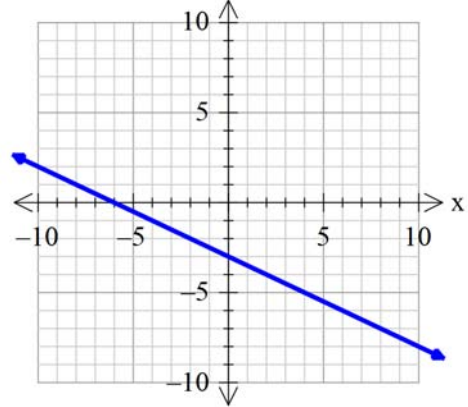
59.

x	y
0	-2
$\frac{5}{3}$	0
$\frac{10}{3}$	2

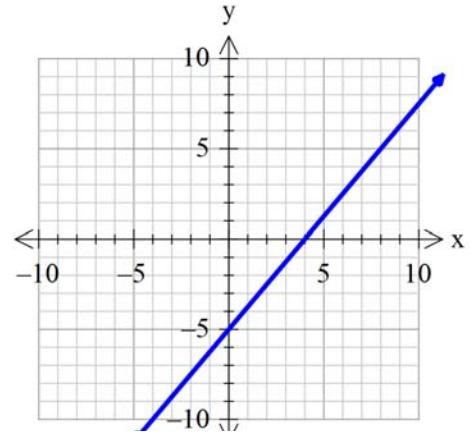
60.

x	y
-3	0
$-\frac{5}{3}$	1
5	6

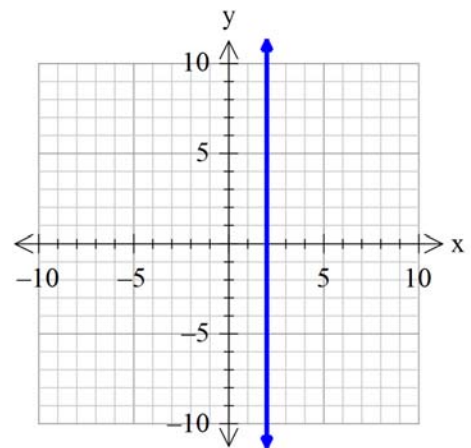
61. x-intercept = -6 , y-intercept = -3



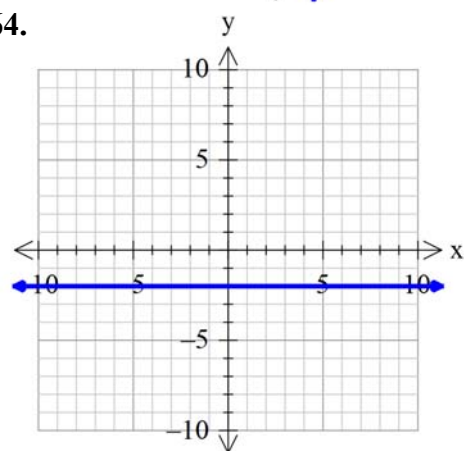
62. x-intercept = 4, y-intercept = -5



63.



64.



65. $m = \frac{1}{3}$

66. $m = \frac{5}{3}$

67. **undefined**

68. $m = 0$

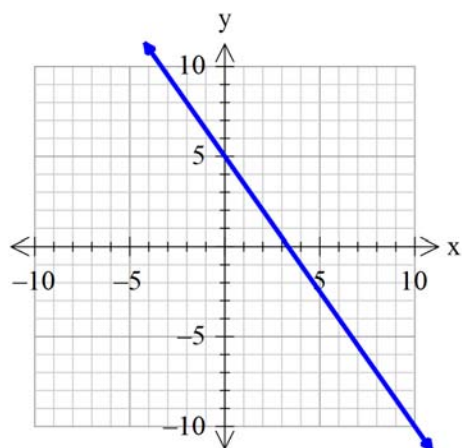
69. $m = \frac{7}{9}, y\text{-int} = -2$

70. $m = \frac{-2}{5}, y\text{-int} = 3$

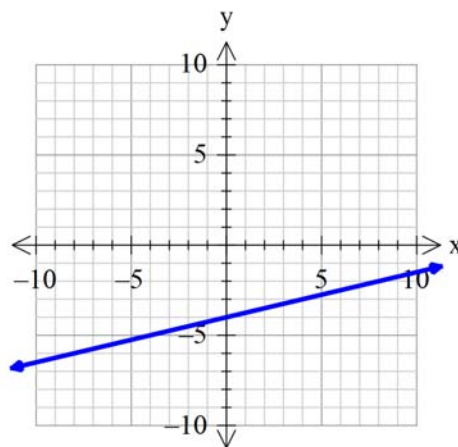
71. $y = \frac{3}{5}x - 2$

72. $y = \frac{-2}{7}x + \frac{1}{2}$

73.



74.



75. $(9, 3)$

76. $(-3, 21)$

77. $(-2, -2)$

78. $(3, 2)$

79. **Dependent**

80. **Inconsistent or No Solution**

81. $x = \frac{15}{11}$

82. $x = \frac{-7}{11}$

83. $\frac{1}{12} = \frac{x}{30}, \frac{5}{6}$ **cup of flour**

84. $\frac{132}{4} = \frac{x}{9}, 297$ **miles**