

Los Angeles Mission College

Math 115: Elementary Algebra

Common Final Practice Set

This practice set is a compilation of 102 questions that are similar in content to those on the common final.

Since the content is similar, it is important for you to work out and understand the concept of each problem given in this practice set.

The actual common final exam given at the end of the semester will consist of two parts:

Part I: 30 multiple-choice questions.

Part II: 4 to 6 free response questions.

It is recommended that you spend approximately 1 hour and 15 minutes on the multiple-choice section and about 45 minutes on the free response part.

Work must be shown in a clear and logical manner for both Part I and Part II. On the multiple-choice part, credit will be given based on the correct answers only. On the free response part, partial credit will be given based on the clarity and logic of each step.

You will be allowed to use a scientific calculator, but not a graphing calculator, computer, or cell phone. Backpacks are not allowed in the examination room either.

Finally, in order to be admitted to the common final exam you need to arrive 15 minutes before the exam begins and show a picture ID. Bring a couple of sharpened #2 pencils, a good eraser, and a scientific calculator. Scantrons and scratch paper will be provided.

I. Solving First Degree Equations or Inequalities

1. Solve: $3(2t+1) = 4(3t-2)$

- a) $t = \frac{1}{2}$ b) $t = \frac{5}{6}$ c) $t = \frac{6}{11}$ d) $t = \frac{11}{6}$ e) $t = -\frac{11}{18}$

2. Solve: $3(n-10) - 5(n+12) = -86$

- a) $n = -88$ b) $n = -2$ c) $n = 58$ d) $n = 44$ e) $n = \frac{43}{45}$

3. Solve: $\frac{n}{3} + \frac{5n}{6} = \frac{1}{8}$

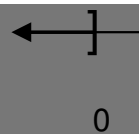
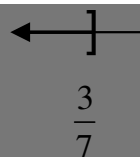
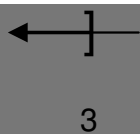
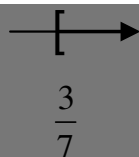
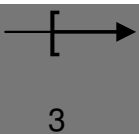
- a) $n = \frac{3}{16}$ b) $n = \frac{1}{7}$ c) $n = \frac{3}{14}$ d) $n = \frac{3}{28}$ e) $n = \frac{6}{28}$

4. Solve: $7x - 8 - 5x < 38$. Write the answer in interval notation.

- a) $\left(-\infty, \frac{13}{3}\right)$ b) $(-\infty, -15)$ c) $\left(-\infty, \frac{15}{6}\right)$ d) $(23, \infty)$ e) $(-\infty, 23)$

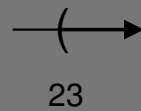
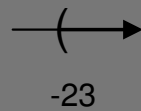
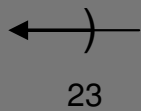
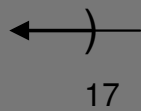
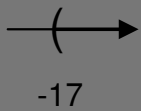
5. Graph the solution to: $6x + 3 - 8x \geq -3$. Write the answer in interval notation.

- a) $[3, \infty)$ b) $\left[\frac{3}{7}, \infty\right)$ c) $(-\infty, 3]$ d) $\left(-\infty, -\frac{3}{7}\right]$ e) $(-\infty, 0]$



6. Graph the solution to: $6(x-1) < 8(x+5)$. Write the answer in interval notation.

- a) $(-17, \infty)$ b) $(-\infty, 17)$ c) $(-\infty, 23)$ d) $(-23, \infty)$ e) $(23, \infty)$



7. Solve: $\frac{3x}{5} - \frac{2}{3} \geq \frac{x}{10}$. Write the answer in interval notation.

- a) $\left[\frac{5}{4}, \infty\right)$ b) $\left[\frac{4}{3}, \infty\right)$ c) $\left[-\frac{5}{4}, \infty\right)$ d) $\left[\frac{10}{11}, \infty\right)$ e) $[2, \infty)$

II. Polynomials and Exponents

8. Multiply: $(3x - 7y)^2$

- a) $9x^2 + 42xy + 49y^2$ b) $9x^2 - 49y^2$ c) $9x^2 - 42xy + 49y^2$
d) $6x - 14y$ e) $9x^2 - 42xy - 49y^2$

9. Multiply: $(x+3)(2x^2 - 4x - 7)$

- a) $2x^3 - 2x^2 - 19x - 21$ b) $2x^3 + 2x^2 - 19x - 21$
c) $2x^3 - 2x^2 + 19x - 21$ d) $2x^3 - 4x^2 - 7x + 3$ e) $2x^3 - 2x^2 - 5x - 21$

10. Simplify: $\frac{-96x^4y^5 + 36x^3y^2}{-12x^2y}$

- a) $8x^2y^4 - 3xy$ b) $-8x^2y^3 + 3xy$ c) $5xy^3$ d) $-5x^5y^6$ e) $-8x^2y^5 + 36x^3y^2$

11. Divide: $(7x^2 - 3x - 4) \div (x - 2)$

- a) $-7x - 11 + \frac{18}{x-2}$ b) $7x - 2$ c) $7x - 11 - \frac{26}{x-2}$ d) $7x + 11 + \frac{18}{x-2}$ e) $7x - 17 + \frac{30}{x-2}$

12. Divide: $(12x^2 + x + 5) \div (3x - 2)$

- a) $-4x - 3 + \frac{x+11}{3x-2}$ b) $\frac{(4x+3)(3x+2)}{3x-2}$ c) $-4x - 3 + \frac{-11}{3x-2}$ d) $4x + 3 + \frac{11}{3x-2}$ e) $4x + 3$

13. Evaluate: $3^{-2} \cdot (-16)^0$

- a) $-\frac{16}{9}$ b) $\frac{1}{9}$ c) 9 d) -9 e) -144

14. Evaluate: $\left(\frac{3}{4}\right)^{-3}$

- a) $-\frac{9}{-12}$ b) $\frac{27}{64}$ c) $\frac{64}{27}$ d) $-\frac{27}{4}$ e) $\frac{12}{9}$

15. Simplify: $(2x^2y)^4(3xy^3)$

- a) $24x^9y^7$ b) $48x^{17}y^4$ c) $48x^3y^4$ d) $48x^9y^7$ e) $48x^2y^3$

16. Simplify: $(x^4y^{-2})^{-2}$ (Express the answer using a positive exponent)

- a) $\frac{x^{16}}{y^4}$ b) $\frac{y^4}{x^8}$ c) $\frac{y^4}{x^{16}}$ d) $\frac{x^8}{y^4}$ e) x^8y^4

17. Simplify: $\left(\frac{35x^2}{7x^{-1}}\right)^{-1}$ (Express the answer using a positive exponent)

- a) $\frac{7}{35x^3}$ b) $\frac{1}{5x}$ c) $5x^3$ d) $5x$ e) $\frac{1}{5x^3}$

III. Factoring

18. Factor completely: $ab + 3a + bc + 3c$

- a) $a(b+3) + c(b+3)$ b) $(a+3)(b+c)$ c) $(a+3)^2(a+c)$
d) $b(a+c) + 3(a+c)$ e) $(a+c)(b+3)$

19. Factor completely: $2x - 2y - ax + ay$

- a) $2(x-y) - a(x+y)$ b) $(x-y)(2-a)$ c) $(x-y)^2(2-a)$
d) $(2-a)(x-y)(x+y)$ e) $2(x-y) - a(x-y)$

20. Factor completely: $84x^2y^3 + 12xy^3$

- a) $12xy^3(7x)$ b) $xy^3(84x+12)$ c) $12xy(7xy^2 + y^2)$ d) $12xy^3(7x+1)$ e) $4xy^3(21x+3)$

21. Factor completely: $49y^2 - 64x^2$

- a) $(7y+8x)(7y-8x)$ b) $(y+4x)(49y-16x)$ c) $(49y+x)(y-64x)$
d) $(7y-8x)^2$ e) Non-factorable

22. Factor completely: $a^2 + 3ab - 54b^2$

- a) $(a-54b)(a+b)$ b) $(a+9b^2)(a-b)$ c) $(a+9b)(a-6b)$
d) $(a+6b)(a-9b)$ e) $(a-9b)(a-6b)$

23. Factor completely: $16x^2 - 26x + 3$

- a) $(4x+1)(4x+3)$ b) $(4x-1)(4x-3)$ c) $(8x-3)(2x+1)$
d) $(2x-3)(8x-1)$ e) $(16x^2-1)(x-3)$

24. Factor completely: $4x^2 - 20xy + 25y^2$

- a) $(2x-5y)(2x-5y)$ b) $(4x-5y)(x+5y)$ c) $(2x+5y)(2x-5y)$
d) $(4x-5y^2)(x+5)$ e) $(2x-y)(2x-25y)$

25. Factor completely: $x^4 - y^4$

- a) $(x^2 - y^2)(x^2 + y^2)$ b) $(x - y)^2(x + y)^2$ c) $(x^2 + y^2)(x + y)(x - y)$
d) $(x - y)(x + y)(x + y)(x + y)$ e) $(x^2 + y^2)(x + y)(x + y)$

IV. Simplifying Algebraic Fractions

26. Simplify: $\frac{15x^3y}{3y^2} \cdot \frac{2x}{y} \div \frac{45x^3}{y^4}$

- a) $\frac{2xy^2}{9}$ b) $\frac{30xy^2}{135}$ c) $\frac{450x^7}{y^6}$ d) $\frac{2xy^3}{9}$ e) $\frac{2x^4y^5}{9x^3y^3}$

27. Simplify: $\frac{6n^2 + 7n - 3}{n + 1} \div \frac{2n^2 + 3n}{n^2 - 1}$

- a) $\frac{n^2 + 2n - 3}{n}$ b) $\frac{(n - 1)(3n - 1)}{n}$ c) $\frac{(6n^2 + 7n - 3)(n - 1)}{2n^2 + 3n}$ d) $\frac{6n^2 + 3n + 4}{-1}$ e) $\frac{(6n^2 + 4)}{2 + 3n}$

28. Simplify: $\frac{x^2 + 4xy + 4y^2}{x^2} \cdot \frac{x^2 - 2xy}{x^2 - 4y^2}$

- a) $\frac{(x + 2y)(x + 2y)}{x(x + 2y)}$ b) $\frac{(x - 2y)}{x}$ c) $(4xy - 1)(-2xy)$ d) $\frac{x + 2y}{x}$ e) $x(2x + 4y^2)$

29. Simplify: $\frac{2a^2 - 11a - 21}{3a^2 + a} \cdot \frac{3a^2 - 11a - 4}{2a^2 - 5a - 12}$

- a) $\frac{(a - 7)(3a + 1)}{3a^2 + a}$ b) $\frac{(a + 7)}{a}$ c) -6 d) 7 e) $\frac{a - 7}{a}$

30. Simplify: $\frac{7}{8x} + \frac{5}{12x}$

a) $\frac{12}{20x}$

b) $\frac{31}{24x}$

c) $\frac{3}{5x}$

d) $\frac{1}{2x}$

e) $\frac{124}{96x}$

31. Simplify: $\frac{4}{x^2 - 4} - \frac{1}{x - 2}$

a) $\frac{-x+6}{(x+6)(x+2)}$

b) $\frac{3}{(x-2)(x+2)}$

c) $\frac{-x+2}{(x+2)(x-2)}$

d) $\frac{1}{(x+2)}$

e) $-\frac{1}{x+2}$

32. Simplify: $\frac{4}{x-2} - \frac{3}{2-x}$

a) $\frac{7}{x-2}$

b) $\frac{-7x+14}{(x-2)(2-x)}$

c) $\frac{1}{-(x-2)}$

d) $\frac{1}{(x-2)}$

e) $\frac{7}{(x+2)}$

33. Simplify: $\frac{3x}{3x-2} + \frac{2}{2-3x}$

a) 1

b) $\frac{3x+2}{3x-2}$

c) $\frac{3x+2}{(3x-2)(2-3x)}$

d) $\frac{3x-2}{-(2-3x)}$

e) $\frac{-1}{2-3x}$

34. Simplify: $\frac{2x}{xy + y^2} - \frac{2y}{x^2 + xy}$

a) $\frac{2x^2 + 2x - 2y - 2y^2}{(y + y^2)(x^2 + x)}$ b) $\frac{2(x - y)}{xy}$ c) $\frac{2x - 2y}{(xy + y^2)(x^2 + xy)}$ d) $\frac{2(x + y)}{xy}$ e) $\frac{2(x^2 + y^2)}{xy(x + y)}$

35. Simplify: $\frac{x}{x^2 + 6x + 8} - \frac{5}{x^2 - 3x - 10}$

a) $\frac{x - 5}{(x + 4)(x + 2)(x - 5)}$ b) $\frac{x^2 - 10x + 20}{(x + 4)(x + 2)(x - 5)}$ c) $\frac{x^2 - 20}{(x + 4)(x + 2)(x - 5)}$
 d) $\frac{x^2 - 10x - 20}{(x + 2)(x + 4)(x - 5)}$ e) $\frac{x^3 - 8x^2 - 40x - 40}{(x + 4)(x + 2)(x - 2)(x - 5)}$

36. Simplify: $\frac{1 - \frac{6}{y}}{3 - \frac{2}{y}}$

a) $\frac{y^2 - 6y}{3y^2 - 2y}$ b) -5 c) $\frac{y - 6}{3y - 2}$ d) $\frac{3y^2 - 20y + 18}{y^2}$ e) $\frac{y - 4}{y}$

37. Simplify: $\frac{\frac{3}{x^2} - \frac{2}{x}}{\frac{4}{x} - \frac{7}{x^2}}$

a) $\frac{-(x^2 - 10)}{x^2}$ b) $\frac{3 - 2x}{4x - 7}$ c) $\frac{4x - 7}{3 - 2x}$ d) $\frac{3x - 2x^2}{4x^2 - 7x}$ e) $-\frac{1}{3}$

38. What is the restriction on x in the following expression? $\frac{x+4}{2x-3}$ (Do not solve the equation)

- a) $x \neq -\frac{3}{2}$ b) $x \neq 4$ c) $x \neq 0$ d) $x \neq \frac{3}{2}$ e) $x \neq \frac{3}{2}, x \neq -4$

39. What values of x will make $\frac{3x-1}{(x-4)(x+1)}$ undefined?

- a) $\{1, 4\}$ b) $\left\{\frac{1}{3}\right\}$ c) $\left\{\frac{1}{3}, 1, 4\right\}$ d) $\{-2, 2\}$ e) $\{-1, 4\}$

40. Evaluate: $3xy - \frac{y}{x}$ for $x = -2$ and $y = 4$

- a) $-\frac{47}{2}$ b) -26 c) -22 d) 22 e) 26

41. Evaluate: $-x^2 - y^3$ for $x = -3$ and $y = -2$

- a) 17 b) -1 c) -23 d) -17 e) 1

42. Evaluate: $5x^2 + 2y^3$ for $x = -4$ and $y = -1$

- a) 78 b) 82 c) -46 d) -78 e) -123

V. Roots and Radicals

43. Simplify: $4\sqrt{18} - 6\sqrt{50} - 3\sqrt{72}$

- a) $36\sqrt{2}$ b) $36\sqrt{6}$ c) $-36\sqrt{2}$ d) $-5\sqrt{110}$ e) $-60\sqrt{2}$

44. Simplify: $\frac{1}{2}\sqrt{20} + \frac{2}{3}\sqrt{45} - \frac{1}{4}\sqrt{80}$

- a) $\sqrt{5} + 2\sqrt{5} - \sqrt{5}$ b) $2\sqrt{15}$ c) $4\sqrt{15}$ d) $\frac{1}{2}\sqrt{5}$ e) $2\sqrt{5}$

45. Simplify: $\sqrt{63x^4y^3}$

- a) $3x\sqrt{7y^3}$ b) $3x^2y\sqrt{7y}$ c) $3x^2\sqrt{7x^2y^3}$ d) $x^2y\sqrt{63y}$ e) $3\sqrt{7x^4y^3}$

46. Simplify: $\sqrt[3]{40x^5y^6}$

- a) $2xy\sqrt[3]{5xy}$ b) $2x^2y^3\sqrt[3]{10x^3}$ c) $2xy^2\sqrt[3]{5x^2}$ d) $2x^2y^2\sqrt[3]{5x}$ e) $2x^4\sqrt[3]{10xy^3}$

47. Simplify: $(3\sqrt{2} - \sqrt{3})(5\sqrt{3} + 4\sqrt{3})$

- a) $27\sqrt{6} - 27$ b) $27\sqrt{6} - 12 - 5\sqrt{3}$ c) $3\sqrt{6} - 27$ d) $3\sqrt{5} - 9\sqrt{6}$ e) $27\sqrt{6} - 3$

48. Simplify: $(\sqrt{x}+5)(\sqrt{x}-3)$

- a) $x+2\sqrt{x}-15$ b) $\sqrt{x^2}+2\sqrt{x}-15$ c) $x+\sqrt{2x}-15$ d) $x+8\sqrt{x}-15$ e) $2\sqrt{x}+2$

49. Simplify: $\frac{3\sqrt{2}}{\sqrt{5}}$

- a) $\frac{3\sqrt{10}}{25}$ b) $\frac{3\sqrt{10}}{5}$ c) $-\frac{3\sqrt{10}}{5}$ d) $\frac{6}{5}$ e) $\frac{3\sqrt{7}}{5}$

50. Simplify: $\frac{\sqrt{9}}{\sqrt{48y}}$

- a) $\frac{6\sqrt{3y}}{24y^2}$ b) $\frac{\sqrt{3y}}{24y^2}$ c) $\frac{3}{2\sqrt{12y}}$ d) $\frac{\sqrt{3y}}{4y}$ e) $\frac{9}{48y}$

51. Simplify: $\frac{\sqrt{y}}{\sqrt{y}-6}$

- a) $\frac{y+6}{y^2-36}$ b) $\frac{1}{y-6}$ c) $-\frac{1}{6}$ d) $\frac{\sqrt{2y}+6\sqrt{y}}{y-36}$ e) $\frac{y+6\sqrt{y}}{y-36}$

52. Simplify: $\frac{\sqrt{6}}{\sqrt{12+\sqrt{2}}}$

- a) $\frac{\sqrt{2}}{10}$ b) $\frac{3\sqrt{2}-\sqrt{3}}{5}$ c) $\frac{1}{2\sqrt{2}}$ d) $\frac{21-6\sqrt{3}}{55}$ e) $\frac{3\sqrt{2}-\sqrt{3}}{6}$

VI. Solving Second Degree Equations, Rational Equations, and Radical Equations

53. Solve: $4n^2 = 32n$

- a) $\{8\}$ b) $\{-\sqrt{2}, \sqrt{2}\}$ c) $\{2, 6\}$ d) $\{-3, 3\}$ e) $\{0, 8\}$

54. Solve: $\frac{x}{x-2} - \frac{7}{x+1} = 1$

- a) $\{-1, 2\}$ b) $\{6\}$ c) $\left\{\frac{16}{5}\right\}$ d) $\{-3, 3\}$ e) $\{-5, -1\}$

55. Solve: $\frac{t}{4t+4} + \frac{5}{t^2-1} = \frac{1}{4}$

- a) $\{21\}$ b) $\{-1, 1\}$ c) $\{-21\}$ d) $\{19\}$ e) $\left\{\frac{1}{20}\right\}$

56. Solve: $x^2 + 4x - 14 = 0$

- a) $\{-2 \pm 3\sqrt{2}\}$ b) $\{-2 \pm \sqrt{10}\}$ c) $\{-2 \pm 6\sqrt{2}\}$ d) $\{-4 \pm 3\sqrt{2}\}$ e) $\{-7, 2\}$

57. Solve: $n + \frac{1}{n} = 5$

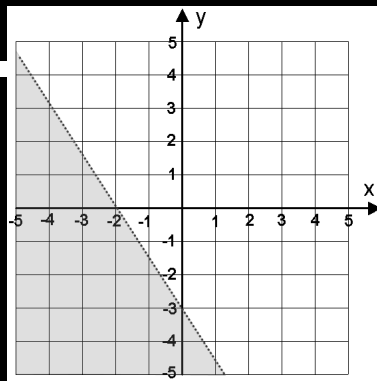
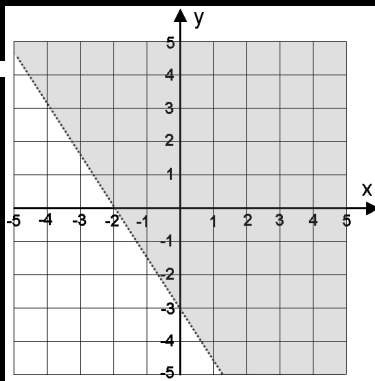
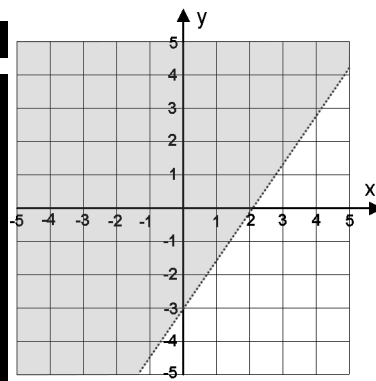
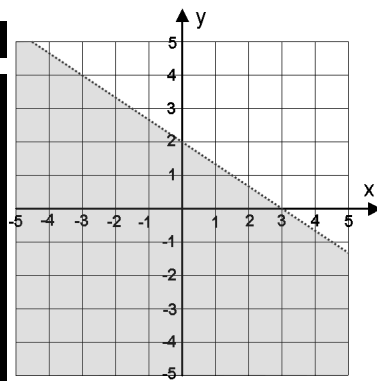
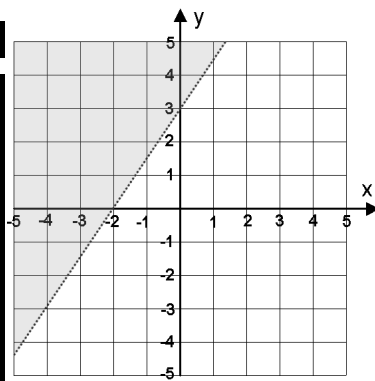
- a) $\left\{\frac{-5 \pm \sqrt{21}}{2}\right\}$ b) $\left\{\frac{5 \pm \sqrt{29}}{2}\right\}$ c) $\{4\}$ d) $\left\{\frac{5 \pm \sqrt{21}}{2}\right\}$ e) $\left\{\frac{1}{4}\right\}$

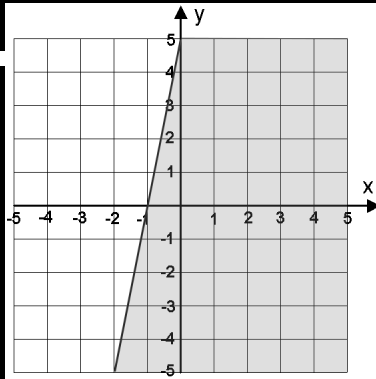
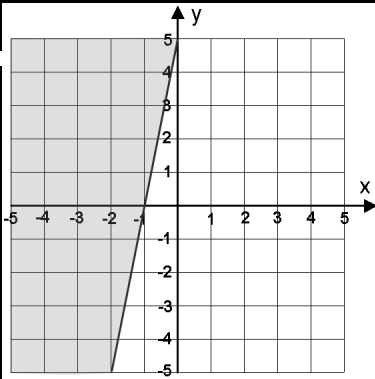
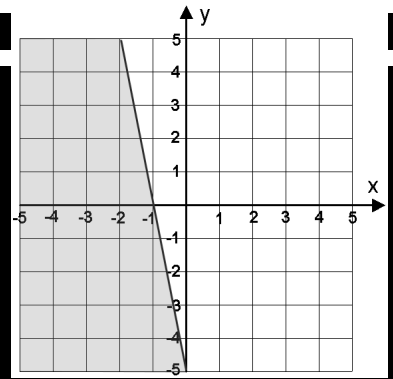
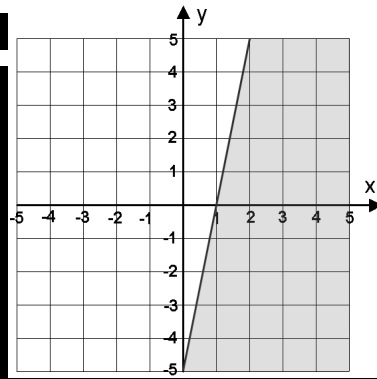
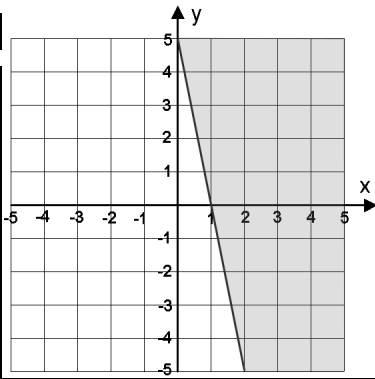
58. Solve and check: $\sqrt{2n-3} = 5$

- a) $\{4\}$ b) $\{1\}$ c) $\{11\}$ d) $\{14\}$ e) $\left\{\frac{3 \pm \sqrt{5}}{2}\right\}$

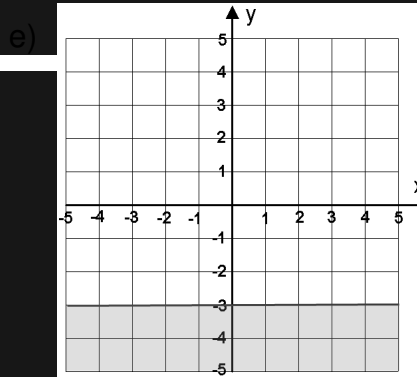
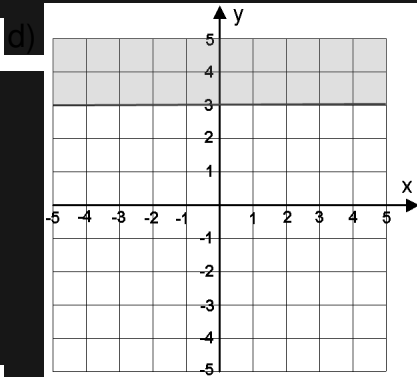
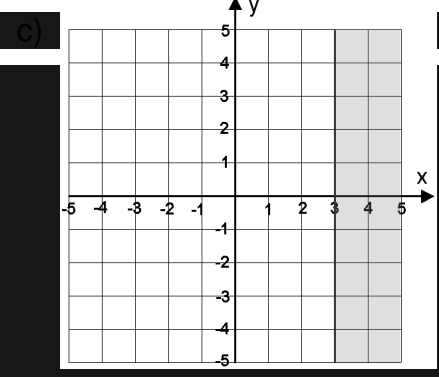
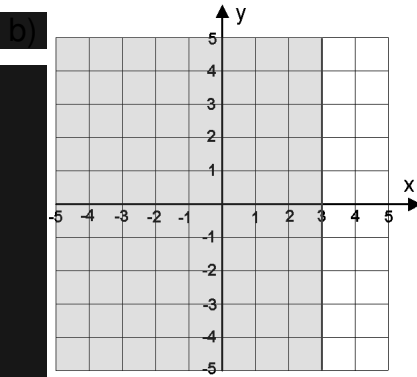
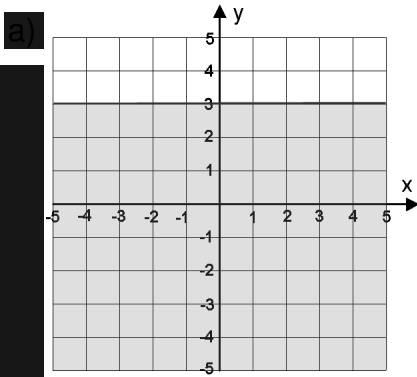
59. Solve and check: $\sqrt{8x} - 2 = x$

- a) $\{-2\}$ b) No Solution c) $\{4 \pm 2\sqrt{3}\}$ d) $\{6 \pm 4\sqrt{2}\}$ e) $\{2\}$

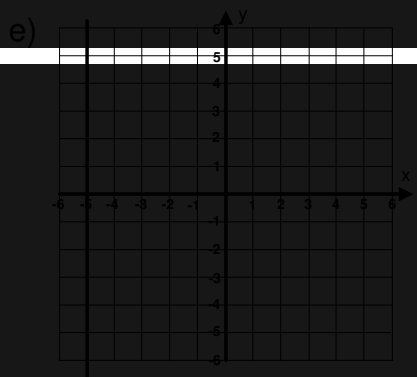
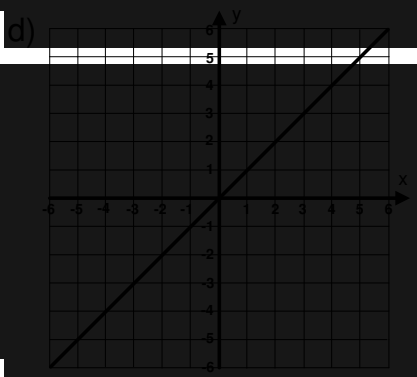
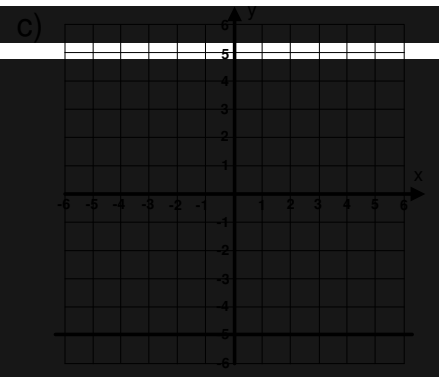
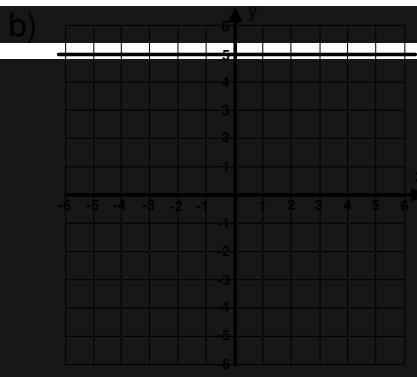
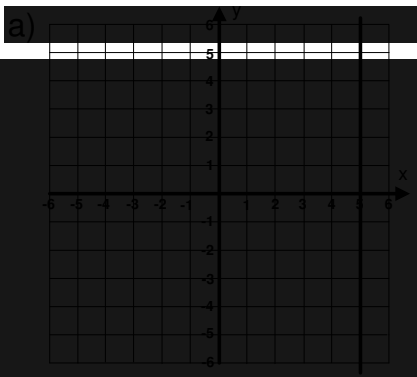




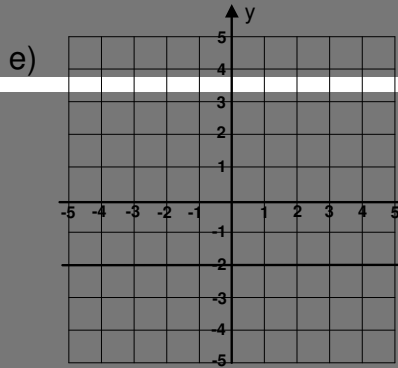
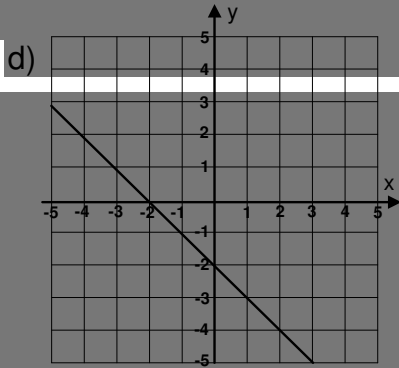
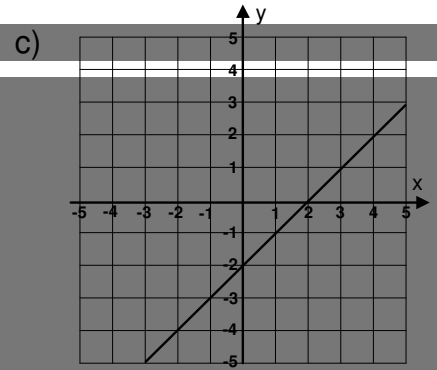
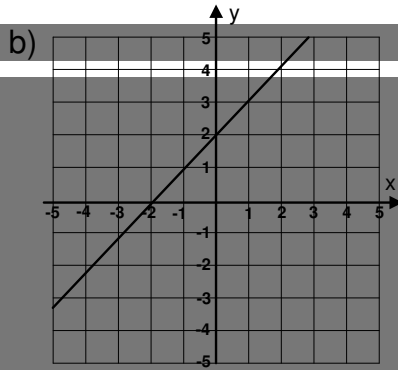
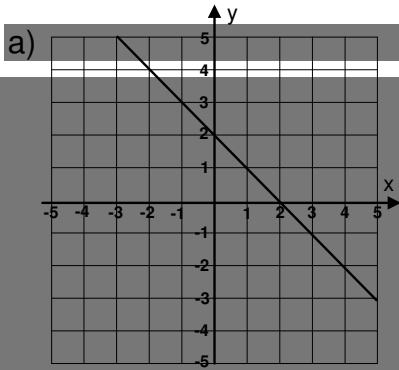
64. Graph $y \geq 3$



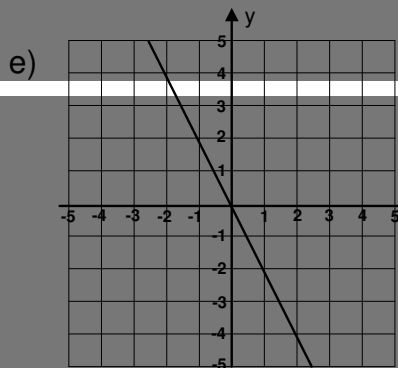
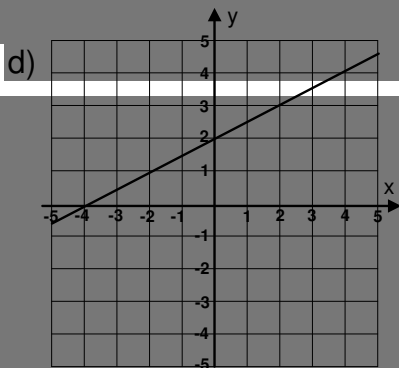
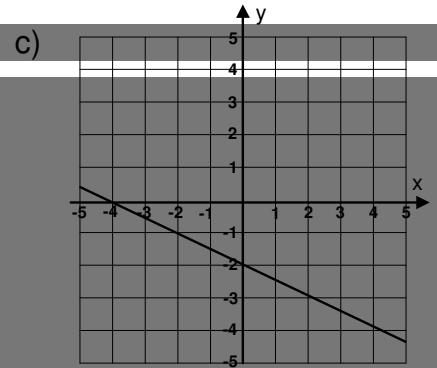
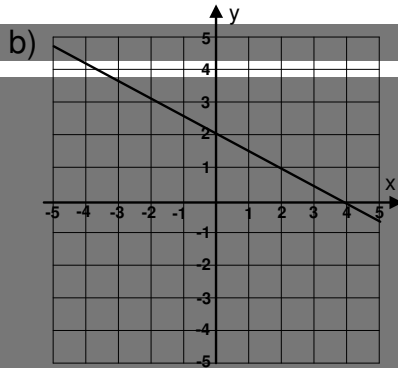
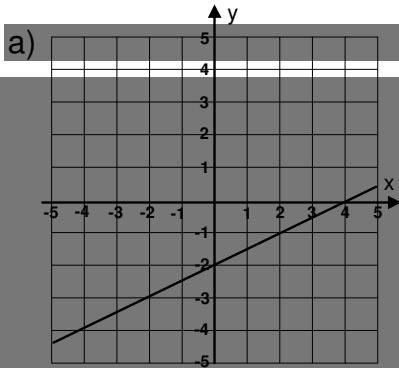
65. Graph $x - 5 = 0$



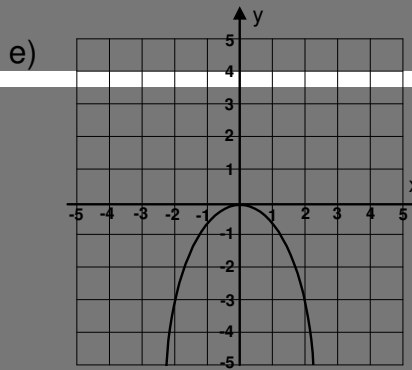
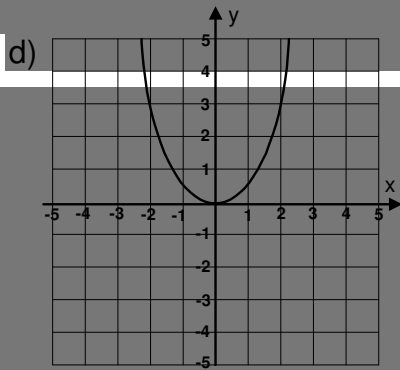
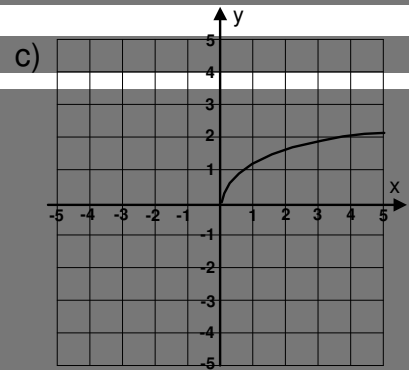
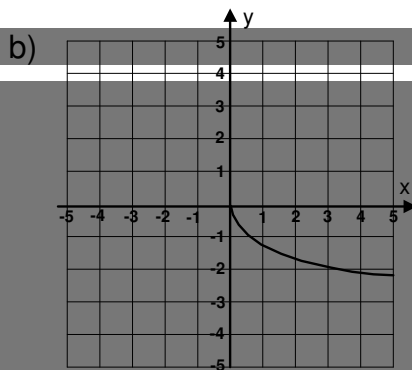
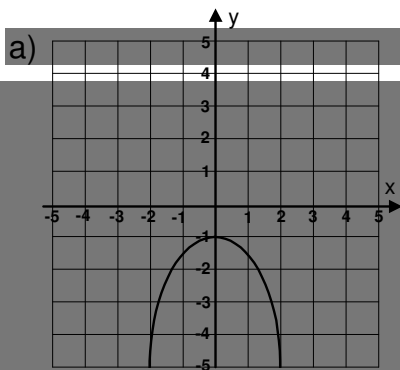
66. Graph $y = x - 2$



67. Graph $x + 2y = 4$



68. Graph: $y = -x^2$



VIII. Slope and Equation of a Line

69. Find the slope between $(-3, 5)$ and $(-2, 8)$.

a) $-\frac{5}{13}$

b) $-\frac{3}{5}$

c) 3

d) -3

e) $\frac{1}{3}$

70. Find the slope of the line determined by $(-2, 4)$ and $(-2, -6)$

a) Undefined

b) 5

c) $\frac{5}{2}$

d) 0

e) -1

71. Write the equation of the line that has a slope of $\frac{3}{5}$ and contains the point $(2, -4)$.

Express the equation in the form $Ax + By = C$, where A , B , and C are integers.

- a) $3x + 5y = -10$ b) $3x - 5y = 22$ c) $3x - 5y = -14$ d) $3x - 5y = 26$ e) $3x - 5y = 50$

72. Write the equation of the line that goes through $(1, 4)$ and $(9, 10)$.

Express the equation in the form $Ax + By = C$, where A , B , and C are integers.

- a) $4x - 3y = -8$ b) $3x - 4y = 19$ c) $7x - 5y = -13$ d) $3x - 4y = 19$ e) $3x - 4y = -13$

73. Find the equation of the line that contains the point $(-4, 8)$ and has a slope of $-\frac{1}{3}$.

Express the equation in the form $Ax + By = C$, where A , B , and C are integers.

- a) $x + 3y = 28$ b) $x + 3y = 20$ c) $x + 3y = -28$ d) $x - 3y = -28$ e) $x + 3y = -4$

74. Find the equation of the line that contains the points $(-1, -2)$ and $(-6, -7)$.

Express the equation in the form $Ax + By = C$, where A , B , and C are integers.

- a) $x - y = 1$ b) $9x - 7y = -5$ c) $x - y = 3$ d) $9x - 5y = -19$ e) $x + y = 1$

75. Determine the slope and y-intercept of $3x - 5y = 15$.

a) $m = \frac{3}{5}$, y - intercept = -3 b) $m = 3$, y - intercept = 15 c) $m = \frac{5}{3}$, y - intercept = 5

d) $m = \frac{3}{5}$, y - intercept = 3 e) $m = -\frac{3}{5}$, y - intercept = -3

76. Determine the slope and y-intercept of $9x + 7y = 0$.

a) $m = -9$, y - intercept = 0 b) $m = -\frac{9}{7}$, y - intercept = 0 c) $m = \frac{9}{7}$, y - intercept = 0

d) $m = -\frac{9}{7}$, y - intercept = 1 e) $m = 0$, y - intercept = $-\frac{9}{7}$

IX. Systems of Equations

77. Solve for x :
$$\begin{cases} 3x + 2y = 7 \\ 4x - 5y = 3 \end{cases}$$

a) $\frac{41}{23}$ b) $\frac{10}{23}$ c) $\frac{10}{7}$ d) $-\frac{41}{23}$ e) $\frac{19}{23}$

78. Solve for y :
$$\begin{cases} 2x + 5y = 7 \\ x + 3y = 1 \end{cases}$$

a) -8 b) 1 c) $\frac{11}{5}$ d) -5 e) 16

79. Solve : $\begin{cases} x + y = 6 \\ 2x + 2y = 5 \end{cases}$

- a) (1, 5) b) Infinitely many solutions. c) No solution. d) (2, 3) e) (-1, 7)

80. Solve for x : $\begin{cases} y = \frac{1}{3}x - 2 \\ x - 3y = 6 \end{cases}$

- a) No solution. b) 6 c) 0 d) 13 e) Infinitely many solutions.

X. Word Problems

81. One more than five times a certain number is equal to 11 less than nine times the number. What is the number?

82. Find two consecutive whole numbers such that the smaller number subtracted from five times the larger number equals 57.

83. The sum of two numbers is 17. If twice the smaller number is 1 more than the larger number, find the numbers.

84. How many liters of a 10% salt solution must be mixed with 15 liters of a 40% salt solution to obtain 20% salt solution?

85. How many liters of pure alcohol must be added to 20 liters of a 40% solution to obtain a 60% solution?

86. A woman invests a total of \$5000. Part of it is invested at 10% and the remainder at 12%. Her total yearly interest from the two investments is \$560. How much did she invest at each rate?

87. Suppose that Lou invested a certain amount of money at 9% interest and \$250 more than that amount at 10%. His total yearly interest was \$101. How much did he invest at each rate?

88. Kirk starts jogging at 5 miles per hour. One-half hour later, Nancy starts jogging on the same route at 7 miles per hour. How long will it take Nancy to catch Kirk?

89. Suppose that Celia rides her bicycle 60 miles in 2 hours less time than it takes Tom to ride his bicycle 85 miles. If Celia rides 3 miles per hour faster than Tom, find their respective rates.

90. The length of a rectangle is 2 inches less than twice its width. If the area of the rectangle is 112 square inches, find the length of the rectangle.

91. The sum of the areas of two circles is 80π square centimeters. Find the length of the radius of each circle if one of them is twice as long as the other.

92. Cindy has 43 coins consisting of nickels and dimes. The total value of the coins is \$3.40. How many coins of each kind does she have?

93. Three cans of prune juice and 2 cans of tomato juice cost \$3.85. On the other hand, 2 cans of prune juice and 3 cans of tomato juice cost \$3.55. Find the cost per can of each.

94. Each of three consecutive even whole numbers is squared. The three results are added and the sum is 596. Find the numbers.

95. Betty bought 30 stamps for \$41.94. Some of them were \$3.00 stamps and the rest were 33-cent stamps. How many of each kind did she buy?

XI. Formulas and Functions

96. What is the restriction on $f(x) = \frac{x+3}{3x-2}$?

- a) $x \neq \frac{2}{3}$ b) $x \neq -\frac{2}{3}$ c) $x \neq -\frac{2}{3}, x \neq -3$ d) $x \neq -3$ e) $x \neq 0$

97. Solve for b: $A = \frac{1}{2}bh$

- a) $b = \frac{A}{2h}$ b) $b = 2Ah$ c) $b = \frac{2A}{h}$ d) $b = \frac{h}{2A}$ e) $b = \frac{2h}{A}$

98. Solve for L: $P = 2L + 2W$

- a) $L = \frac{P+W}{2}$ b) $L = \frac{2W-P}{2}$ c) $L = \frac{P+2W}{2}$ d) $L = \frac{P-2W}{2}$ e) $L = \frac{2-W}{2}$

99. Solve for C: $F = \frac{9C + 160}{5}$

a) $C = \frac{5F + 160}{9}$

b) $C = \frac{5F - 160}{9}$

c) $C = \frac{-5F + 32}{9}$

d) $C = \frac{5F - 32}{9}$

e) $C = \frac{-155F}{9}$

100. Solve for x: $3x - 4y = -7$

a) $x = \frac{-4y - 7}{3}$

b) $x = \frac{-4y + 7}{3}$

c) $x = \frac{4y - 7}{3}$

d) $x = \frac{4y + 7}{3}$

e) $x = 4y - 10$

101. If $f(x) = 3x - 5$, find $f(-2)$.

a) -10

b) 1

c) -11

d) 0

e) -8

102. If $f(x) = -5x - 1$; find $f(3)$.

a) 14

b) -11

c) 16

d) -16

e) -14

Common Final Practice Set Answer Sheet

1. (d) $t = \frac{11}{6}$

2. (b) $n = -2$

3. (d) $n = \frac{3}{28}$

4. (e) $(-\infty, 23)$

5. (c) $(-\infty, 3]$

6. (d) $(23, \infty)$

7. (b) $\left[\frac{4}{3}, \infty\right)$

8. (c) $9x^2 - 42xy + 49y^2$

9. (b) $2x^3 + 2x^2 - 19x - 21$

10. (a) $8x^2y^4 - 3xy$

11. (d) $7x + 11 + \frac{18}{x-2}$

12. (d) $4x + 3 + \frac{11}{3x-2}$

13. (b) $\frac{1}{9}$

14. (c) $\frac{64}{27}$

15. (d) $48x^9y^7$

16. (b) $\frac{y^4}{x^8}$

17. (e) $\frac{1}{5x^3}$

18. (e) $(a+c)(b+3)$

19. (b) $(x-y)(2-a)$

20. (d) $12xy^3(7x+1)$

21. (a) $(7y+8x)(7y-8x)$

22. (c) $(a+9b)(a-6b)$

23. (d) $(2x-3)(8x-1)$

24. (a) $(2x-5y)(2x-5y)$

25. (c) $(x^2 + y^2)(x+y)(x-y)$

26. (a) $\frac{2xy^2}{9}$

27. (b) $\frac{(n-1)(3n-1)}{n}$

28. (d) $\frac{x+2y}{x}$

29. (e) $\frac{a-7}{a}$

30. (b) $\frac{31}{24x}$

31. (e) $-\frac{1}{x+2}$

32. (a) $\frac{7}{x-2}$

33. (a) 1

34. (b) $\frac{2(x-y)}{xy}$

35. (d) $\frac{x^2 + 10x - 20}{(x+2)(x+4)(x-5)}$

36. (c) $\frac{y-6}{3y-2}$

37. (b) $\frac{3-2x}{4x-7}$

38. (d) $x \neq \frac{3}{2}$

39. (e) $\{-1, 4\}$

40. (c) -22

41. (b) -1

42. (a) 78

43. (c) $-36\sqrt{2}$

44. (e) $2\sqrt{5}$

45. (b) $3x^2y\sqrt{7y}$

46. (c) $2xy^2\sqrt[3]{5x^2}$

47. (a) $27\sqrt{6} - 27$

48. (a) $x + 2\sqrt{x} - 15$

49. (b) $\frac{3\sqrt{10}}{5}$

50. (d) $\frac{\sqrt{3y}}{4y}$

51. (e) $\frac{y + 6\sqrt{y}}{y - 36}$

52. (b) $\frac{3\sqrt{2} - \sqrt{3}}{5}$

53. (e) $\{0, 8\}$

54. (c) $\left\{\frac{16}{5}\right\}$

55. (a) $\{21\}$

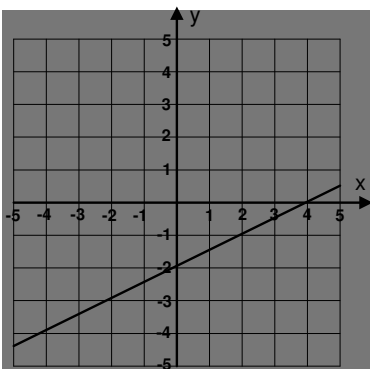
56. (a) $\{-2 \pm 3\sqrt{2}\}$

57. (d) $\left\{\frac{5 \pm \sqrt{21}}{2}\right\}$

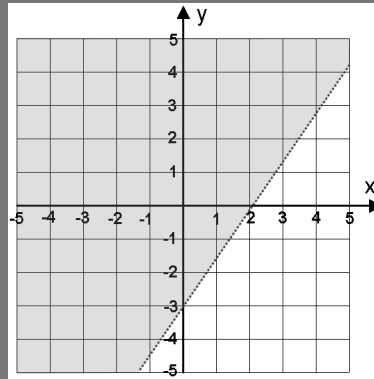
58. (d) $\{14\}$

59. (e) $\{2\}$

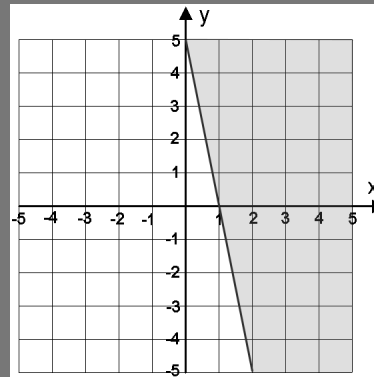
60. (b)



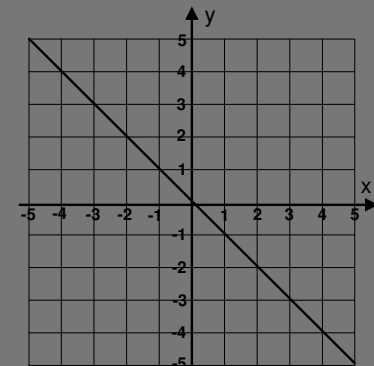
61. (c)



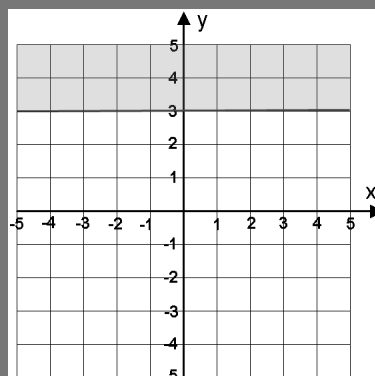
62. (a)



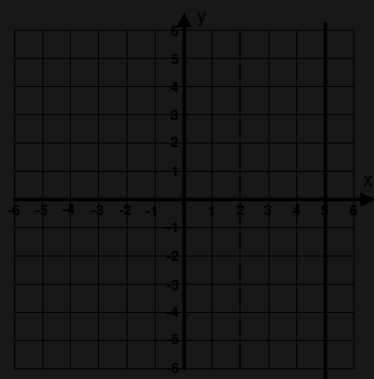
63. (d)



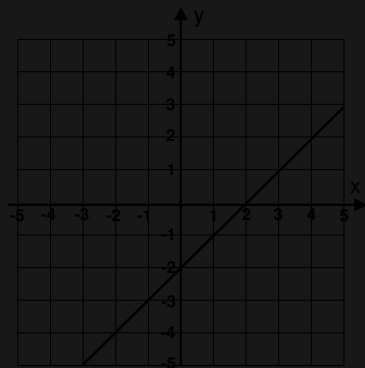
64. (d)



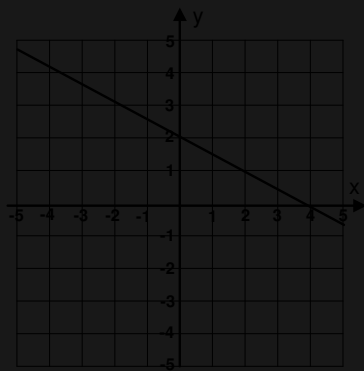
65. (a)



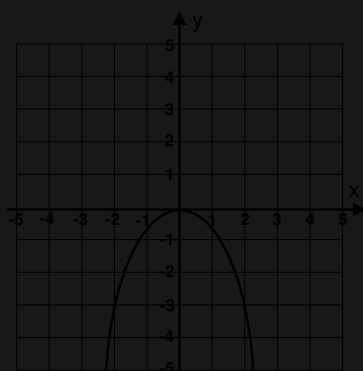
66. (c)



67. (b)



68. (e)



69. (c) 3

70. (a) Undefined

71. (d) $3x - 5y = 26$

72. (e) $3x - 4y = -13$

73. (b) $x + 3y = 20$

74. (a) $x - y = 1$

75. (a) $m = \frac{3}{5}$, y-intercept = -3

76. (b) $m = -\frac{9}{7}$, y-intercept = 0

77. (a) $\frac{41}{23}$

78. (d) -5

79. (c) No solution.

80. (e) Infinitely many solutions.

81. The number is 3.

82. 13, 14

83. 6, 11

84. 30 liters

85. 10 liters

86. \$2,000 at 10% and \$3,000 at 12%

87. \$400 at 9% and \$650 at 10%

88. $1 \frac{1}{4}$ hr.

89. Tom: 17 mph; Celia: 20 mph

90. Length = 14 in

91. Radius of small circle = 4 cm. Radius of large circle = 8 cm.

92. 18 nickels and 25 dimes

93. Prune juice: \$0.89 per can. Tomato juice: \$0.59 per can.

94. 12, 14, 16

95. 12 \$3.00 stamps and 18 \$0.33 stamps

96. (a) $x \neq \frac{2}{3}$

97. (c) $b = \frac{2A}{h}$

98. (d) $L = \frac{P - 2W}{2}$

99. (b) $C = \frac{5F - 160}{9}$

100. (c) $x = \frac{4y - 7}{3}$

101. (c) -11

102. (d) -16