Intermediate Algebra Semester Summary Exercises

1. Solve: $-3x + 8 = -3 + 8x + 3x$

A. $x = 1$ B. $x = \frac{11}{14}$ C. $x = \frac{11}{8}$ D. $x = \frac{8}{11}$

2. Solve: $\frac{w}{6} - \frac{3w}{8} = -5$

A. $w = -24$ B. $w = 1$ C. $w = 24$ D. $w = 60$

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

A. $x = \frac{7}{2}$ B. $x = \frac{5}{2}$ C. $x = \frac{1}{2}$ D. $x = -\frac{1}{2}$

4. The perimeter of a rectangle is 42 inches. The length of the rectangle is 3 inches longer than twice the width. Find the LENGTH of the rectangle.

A. 6 in. B. 9 in. C. 12 in. D. 15 in.

5. Money is invested into 2 accounts paying 6% and 5% annual interest. There is $2000 more invested at 6% than at 5%. If the interest after one year is $615, how much is invested at 6%?

A. $4500 B. $4682 C. $6500 D. $6682

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

A. $b = \frac{2A}{h}$ B. $b = \frac{1}{2}Ah$ C. $b = \frac{\frac{1}{2}A}{h}$ D. $b = \frac{A}{h}$

7. Solve the inequality: $-30x - 18 \leq -6(4x + 12)$

A. $[9, \infty)$ B. $(-\infty, 9]$ C. $\left[-\frac{5}{3}, \infty\right)$ D. $\left(-\infty, -\frac{5}{3}\right]$

8. Solve the compound inequality: $x + 4 \geq 10$ AND $-2x \leq 8$

A. $[-4, \infty)$ B. $[6, \infty)$ C. $[-4, 6]$ D. no solution

9. Solve the compound inequality: $3(y + 2) < -9$ OR $4y - 5 > 2y + 7$

A. $(-1,1)$ B. $(-5,6)$ C. $(-\infty, -1) \cup (1, \infty)$ D. $(-\infty, -5) \cup (6, \infty)$

10. Solve the inequality: $-2 < t + 3 \leq 5$

A. $(-5, 5]$ B. $(-2, 2]$ C. $(-5, 2]$ D. $(-2, 5]$

11. Solve: $|3x - 5| + 9 = 2$

A. $-\frac{2}{3}$ B. $-\frac{2}{3}\ and\ -2$ C. $-\frac{2}{3}\ and\ 4$ D. no solution

12. Solve: $\left|\frac{x+1}{2}\right| = 3$

A. 2 B. 5 C. 2 and – 4 D. 5 and – 7

13. Express the solution with interval notation: $|3x - 7| \geq 7$

A. $[0, \infty)$ B. $\left[\frac{14}{3}, \infty\right)$ C. $\left[0, \frac{14}{3}\right]$ D. $\left(-\infty, 0\right] \cup \left[\frac{14}{3}, \infty\right)$

14. Which quadrant contains the point (-6,2)?

A. I B. II C. III D. IV

15. Find the coordinates of the x-intercept. $3x - 2y = 12$

A. (0, –6) B. (–6,0) C. (4,0) D. (0,4)

16. Find the coordinates of the y-intercept. $3x - 2y = 12$

A. (0, –6) B. (–6,0) C. (4,0) D. (0,4)

17. Find the slope of the line passing through the points. (1, –5) (–1,1)

A. –3 B. –2 C. $-\frac{1}{3}$ D. $-\frac{1}{2}$

18. Find the slope of the line. $2x + 3y = -9$

A. 2 B. –2 C. $-\frac{2}{3}$ D. $\frac{2}{3}$

19. Find the slope of a line which is perpendicular to the line given by 3x – 6y = 12.

A. 2 B. –2 C. $\frac{1}{2}$ D. $-\frac{1}{2}$

20. Find the equation of the line passing through (4,2) and (2,-1).

A. $y = \frac{3}{2}x - 8$ B. $y = \frac{3}{2}x - 4$ C. $y = \frac{1}{2}x$ D. $y = \frac{1}{2}x - 4$

21. Which line has a slope of 0?

A. y = 3 B. x = 4 C. y = 2x D. x = 0

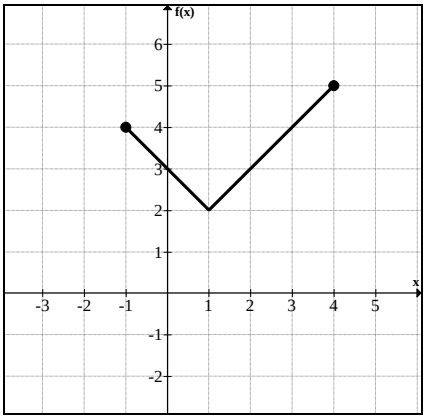
22. For $f(x) = 3x^2 - 5x$, find f(–4).

A. 28 B. 68 C. –28 D. –68

23. For g(x) = 4x – 2, find g(t – 3).

A. 4t – 2 B. 4t – 5 C. 4t – 12 D. 4t – 14

24. Find the domain and range of f(x).



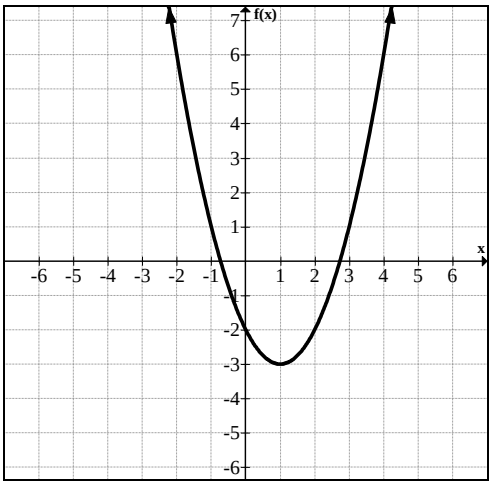
A. domain: (-∞,∞)
range: (-∞,∞)

B. domain: [2,5]
range: [-1,4]

C. domain: [-1,4]
range: [2,5]

D. domain: [-1,∞)
range: [2,∞)

Use the graph of f(x) to answer questions 25 – 27.



25. What is the domain and range of f(x)?

A. domain: (-∞,∞)
range: (-∞,∞)

B. domain: (-∞,∞)
range: [-3,∞)

C. domain: [1,∞)
range: (-∞,∞)

D. domain: [1,∞)
range: [-3,∞)

26. Find f(-2).

A. 0 B. 2 C. 0 and 2 D. 6

27. Find x such that f(x) = 1.

A. -3 B. -1 C. 3 D. -1 and 3

28. Use interval notation to express the domain of $f(x) = \frac{1}{2x+3}$.

A. $\left[-\frac{3}{2}, \infty\right)$ B. $(-\infty, \infty)$ C. $(-\infty, -3) \cup (-3, \infty)$ D. $\left(-\infty, -\frac{3}{2}\right) \cup \left(-\frac{3}{2}, \infty\right)$

29. Use interval notation to express the domain of $g(x) = x^2 - 9$.

A. $(-9, \infty)$ B. $(-\infty, -9)$ C. $(-\infty, \infty)$ D. $[0, \infty)$

30. The function $f(x) = \frac{1}{2x+3}$ is _____.

A. linear B. quadratic C. constant D. none of these

31. The function $g(x) = x^2 - 9$ is _____.

A. linear B. quadratic C. constant D. none of these

32. Solve the system and give the value of x:

$$2x - y = -9$$
$$3x + 2y = 4$$

A. -1 B. -2 C. 5 D. No solution

33. Solve the system and give the value of x:

$$x - 2y = 7$$
$$-3x + 6y = 1$$

A. -4 B. -2 C. Infinite number of solutions D. No solution

34. Solve the system and give the value of y:

$$\frac{3}{2}x + \frac{1}{4}y = -9$$
$$\frac{1}{3}x - \frac{1}{2}y = -2$$

A. 0 B. –6 C. Infinite number of solutions D. No solution

35. Five t-shirts and two hats cost $118. Three t-shirts and four hats cost $110. What is the price of a hat?

A. $12 B. $14 C. $16 D. $18

36. Meg has $1.95 in quarters and dimes. If she has 12 coins, how many DIMES does she have?

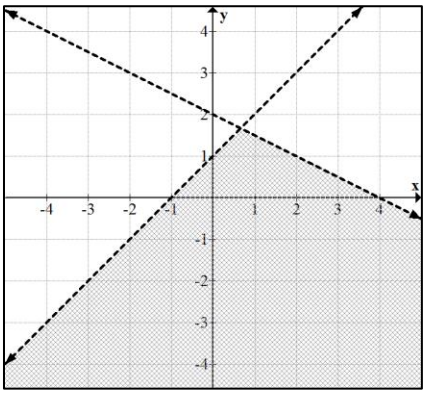
A. 4 B. 5 C. 6 D. 7

37. How much 40% saline solution should be mixed with 60% saline solution to make a mixture of 150 ounces which is 52% saline solution?

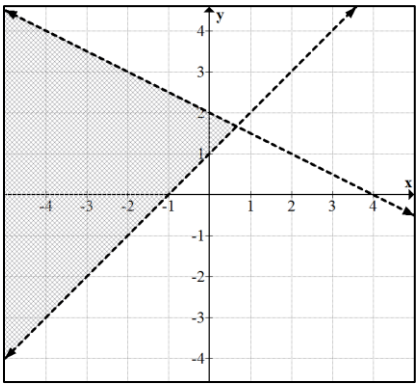
A. 60 ounces B. 70 ounces C. 80 ounces D. 90 ounces

38. Solve: $x + 2y < 4$ AND $x - y > 1$

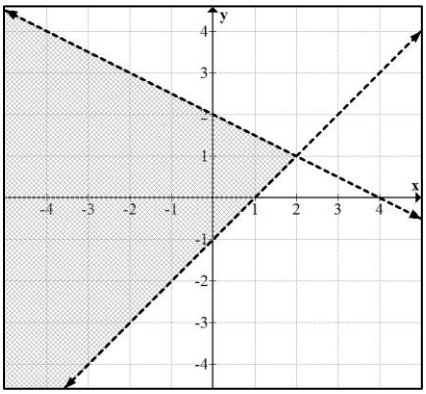
A.



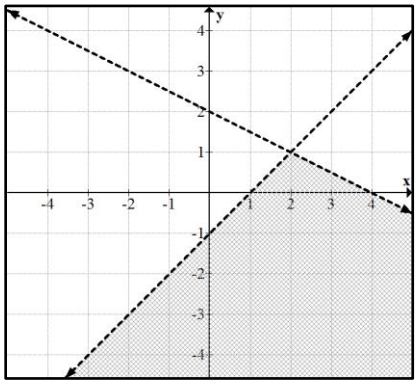
B.



C.



D.



39. Which statement is true for a 2x2 linear system with an infinite number of solutions?

A. The graph of the system is parallel lines.
B. The system is independent.
C. When solving the system algebraically, the variables cancel out and leave a false statement.
D. The system is consistent.

40. For a 2x2 linear system solved with graphing to have one solution, the lines MUST have slopes that are _____.

A. equal B. unequal C. undefined D. parallel

41. Divide. $(3x^3y - 6xy^3 + xy) \div (xy)$

A. $3x^2 - 6y^2$ B. $3x^2 - 6xy^3 + xy$
C. $3x^2 - 6y^2 + 1$ D. $3x^4y^2 - 6x^2y^3 + x^2y^2$

42. Divide. $(x^2 - x - 40) \div (x + 6)$

A. $x + 5 + \frac{2}{x+6}$ B. $x - 7 + \frac{2}{x+6}$

C. $x + 5 + \frac{-82}{x+6}$ D. $x - 7 + \frac{-82}{x+6}$

43. Find a factor of $x^3 + 3x^2 - 5x - 15$.

A. $x^2 + 5$ B. $x - 5$ C. $x^2 + 3$ D. $x + 3$

44. Find a factor of $x^2 - 5x - 6$.

A. $x - 3$ B. $x + 6$ C. $x + 1$ D. $x - 5$

45. Find a factor of $4x^2 + 11x + 6$.

A. $2x + 6$ B. $4x + 3$ C. $x + 3$ D. $2x + 1$

46. Find a factor of $3x^3 + 24x^2y + 48xy^2$.

A. $3x + 12y$ B. $x + 4$
C. $x + 4y$ D. $x^2 + 8x + 16$

47. Factor completely. $16x^2 - 64$

A. $(4x + 8)(4x - 8)$ B. $4(2x - 4)(2x + 4)$
C. $16(x + 2)(x - 2)$ D. prime

48. Factor completely. $x^3 - 64$

A. $(x - 8)^3$ B. $(x - 4)(x^2 - 4x + 16)$
C. $(x - 4)^3$ D. $(x - 4)(x^2 + 4x + 16)$

49. Solve. $3x(x - 5) = 0$

A. 3,5 B. 0, 5 C. 3,0,5 D. $\frac{5}{3}$

50. Solve. $x^2 - 10x = 24$

A. 12, −2 B. 2, −12 C. 6,4 D. −6, −4

51. Solve. $2x^2 - 18x = 0$

A. 2, 3, −3 B. 3, −3 C. 0, 9 D. 2, 0, 9

52. Solve. $2t^2 - 7 = 5t$

A. $1, \frac{7}{2}$ B. $-1, -\frac{7}{2}$ C. $-1, \frac{7}{2}$ D. $1, -\frac{7}{2}$

53. The product of two consecutive integers is 11 more than their sum. Find the SMALLER integer.

A. −4 or 3 B. 4 or −3 C. only 4 D. only −3

54. The height of a triangle is 5 feet more than the base. The area of the triangle is 168 square feet. If the base is x, find the equation used to find the height and base of the triangle.

A. $(x)(x+5) = 168$ B. $(x)(x+5) = \left(\frac{1}{2}\right)168$

C. $\left(\frac{1}{2}\right)(x)(x+5) = 168$ D. $(x)^2 + (x+5)^2 = 168^2$

55. Find the x- and y-intercepts of the function $f(x) = x^2 - 5x + 6$.

A. y-int.: (0,6)
x-int.: (6,0) and (-1,0)

B. y-int.: (0,6)
x-int.: (2,0) and (3,0)

C. y-int.: (6,0)
x-int.: (0,6) and (0,-1)

D. y-int.: (6,0)
x-int.: (0,2) and (0,3)

56. For $f(x) = \frac{x-8}{x+2}$, find f(4).

A. -4 B. -3 C. $-\frac{2}{3}$ D. 2

57. Reduce to lowest terms: $\frac{25-5x}{x^2-25}$

A. $\frac{-5}{x+5}$ B. $\frac{5}{x+5}$ C. $\frac{-1}{x}$ D. $\frac{5}{x}$

58. Multiply and simplify completely: $\left(\frac{x^2-4x}{x^2-9}\right)\left(\frac{x-3}{x-2}\right)$

A. $\frac{2}{3}$ B. $\frac{2x}{x+3}$ C. $\frac{x+2}{x+3}$ D. $\frac{x(x-4)}{(x+3)(x-2)}$

59. Divide and simplify completely: $\frac{x-6}{x^2-16} \div \frac{x-6}{x^2-8x+16}$

A. $\frac{(x-6)^2}{(x-4)^3(x+4)}$ B. $\frac{x-4}{x+4}$ C. $-8x-1$ D. -1

60. Add and simplify completely: $\frac{5}{x}+\frac{8}{x-6}$

A. $\frac{13}{2x-6}$ B. $\frac{-17}{x-6}$ C. $\frac{13}{x(x-6)}$ D. $\frac{13x-30}{x(x-6)}$

61. Subtract and simplify completely: $\frac{9}{x+6}-\frac{2}{x+3}$

A. $\frac{7}{3}$ B. $\frac{7}{x+3}$ C. $\frac{7x+15}{(x+6)(x+3)}$ D. $\frac{7x+39}{(x+6)(x+3)}$

62. Add and simplify completely: $\frac{5}{3-x}+\frac{8}{x^2-9}$

A. $\frac{13}{x^2-x-6}$ B. $\frac{-5x-7}{x^2-9}$ C. $\frac{5x^2-8x-21}{(3-x)(x^2-9)}$ D. $\frac{3}{x+3}$

63. Simplify completely: $\frac{\frac{1}{4}+\frac{1}{x}}{\frac{1}{8}+\frac{1}{x}}$

A. 2 B. $\frac{x+4}{x+8}$ C. $\frac{2x+8}{x+8}$ D. $\frac{x+8}{x+4}$

64. Solve: $1-\frac{21}{x^2}=\frac{4}{x}$

A. -7,3 B. 7,-3 C. 25 D. no solution

65. Solve: $\frac{4}{x+1}=\frac{12}{x}$

A. $-\frac{3}{2}$ B. $-\frac{1}{8}$ C. $\frac{1}{8}$ D. $\frac{1}{2}$

66. In Mrs. Smith's classroom, she uses 102 crayons for every 12 students. How many crayons would she use for 18 students?

A. 324 B. 153 C. 68 D. 2

67. Kent needs 4 hours to pressure wash a parking lot. Jacob needs 9 hours to do the same job. How long would it take them if they worked together? Round the answer to the nearest hundredth of an hour if necessary.

A. 2.5 hours B. 2.77 hours C. 3.25 hours D. 6.5 hours

68. Simplify completely: $\sqrt{270}$

A. $3\sqrt{30}$ B. $9\sqrt{30}$ C. $10\sqrt{27}$ D. $27\sqrt{10}$

69. Simplify completely: $\sqrt[3]{1250}$

A. $5\sqrt{50}$ B. $5\sqrt{10}$ C. $10\sqrt[3]{5}$ D. $5\sqrt[3]{10}$

70. Use interval notation to express the domain of f(x) = $\sqrt[3]{x+4}$.

A. $[-4,\infty)$ B. $[4,\infty)$ C. $(-\infty,\infty)$ D. $(-\infty,-4)\cup(-4,\infty)$

71. Use interval notation to express the domain of f(x) = $\sqrt{x+4}$.

A. $[-4,\infty)$ B. $[4,\infty)$ C. $(-\infty,\infty)$ D. $(-\infty,-4)\cup(-4,\infty)$

72. Add or subtract as indicated and simplify completely: $\sqrt{300b^2x}+b\sqrt{3x}-b\sqrt{75x}$

A. $76b\sqrt{3x}$ B. $6b\sqrt{3x}$ C. $b\sqrt{300b^2x-72x}$ D. $\sqrt{300b^2x}-b\sqrt{72x}$

73. Simplify the expression containing a rational exponent: $(16)^{\frac{5}{4}}$

A. 32 B. 25 C. 20 D. 10

74. Multiply and simplify: $(\sqrt[3]{25x^2})(\sqrt[3]{10x^2})$

A. $125x\sqrt[3]{2x}$ B. $5x\sqrt[3]{2x}$ C. $x^2\sqrt[3]{250}$ D. $5x^2\sqrt[3]{10}$

75. Divide and simplify: $\frac{\sqrt{315}}{\sqrt{20}}$

A. $36\sqrt{7}$ B. $6\sqrt{7}$ C. $\frac{3\sqrt{7}}{2}$ D. $\frac{9\sqrt{7}}{4}$

76. Rationalize and simplify: $\sqrt[3]{\frac{2}{9w}}$

A. $\frac{\sqrt[3]{2w}}{3w}$ B. $\frac{\sqrt[3]{18w^2}}{3w}$ C. $\frac{\sqrt[3]{6w}}{3w}$ D. $\frac{\sqrt[3]{6w^2}}{3w}$

77. Rationalize and simplify: $\frac{6}{4-\sqrt{3}}$

A. $\frac{-6\sqrt{3}}{5}$ B. $6\sqrt{3}$ C. $\frac{24+6\sqrt{3}}{13}$ D. $\frac{24+6\sqrt{3}}{7}$

78. Solve: $\sqrt{x+72} = x$

A. 8 B. 9 C. 9 and -8 D. 8 and -9

79. Solve: $\sqrt[3]{x+4} = -2$

A. -12 B. -4 C. 2 D. no solution

80. One side of a rectangle is 8 inches long. The diagonal is 14 inches long. Find the exact length of the other side of the rectangle.

A. 132 inches B. $2\sqrt{33}$ inches C. $2\sqrt{65}$ inches D. 260 inches

81. Simplify and express as $a+bi$: (4i – 11) – (i + 2)

A. 3i – 9 B. 5i – 9 C. 3i – 13 D. 5i – 13

82. Simplify and express as $a+bi$: $\frac{36+\sqrt{-16}}{4}$

A. 9 + 4i B. 9 + i C. 13i D. 10i

83. Simplify: $\left(\sqrt{-49}\right)\left(\sqrt{-4}\right)$

A. -14 B. 14 C. -14i D. 14i

84. Solve: $2x^2 + 50 = 0$

A. 2, -25 B. -2,25 C. ±5 D. ±5i

85. Fill in the blanks to complete the square: $x^2 - 15x +$ _____ = _____

A. $x^2 - 15x + \left(-\frac{15}{2}\right) = \left(x - \frac{15}{2}\right)^2$ B. $x^2 - 15x + \frac{225}{4} = \left(x - \frac{15}{2}\right)^2$

C. $x^2 - 15x + \frac{15}{2} = \left(x + \frac{15}{2}\right)^2$ D. $x^2 - 15x + \frac{225}{4} = \left(x + \frac{15}{2}\right)^2$

86. Solve: $(x - 7)^2 + 12 = 0$

A. $5i\sqrt{3}$ and $9i\sqrt{3}$ B. $5\sqrt{3}$ and $9\sqrt{3}$

C. $7 \pm 2i\sqrt{3}$ D. $7 \pm 2\sqrt{3}$

87. Solve: $x^2 + 9 = 8x$

A. 9, -1 B. 0, ±3i C. $4 \pm \sqrt{7}$ D. 4 ± 5i

88. Solve: $x^2 - 2x + 8 = 0$

A. $1 \pm i\sqrt{7}$ B. $1 \pm 2i\sqrt{7}$ C. $1 \pm 3i$ D. $\pm i\sqrt{7}$

89. Solve: $x^4 - 29x^2 + 100 = 0$

A. -4, -25 B. 4, 25 C. ±2, ±5 D. ±2i, ±5i

90. Solve: $4x^2 - 2x - 1 = 0$

A. $\frac{1\pm\sqrt{5}}{4}$ B. $\frac{1\pm2\sqrt{5}}{4}$ C. $1 \pm \sqrt{5}$ D. $\frac{2\pm\sqrt{5}}{4}$

91. The shorter leg of a right triangle measures 10 feet. The longer leg is 4 feet less than the measure of the hypotenuse. Find the length of the longer leg.

A. 14.5 feet B. 10.5 feet C. 8 feet D. 6 feet

92. Find the y- and x-intercepts of $f(x) = 4x^2 + 8x - 7$. Round to the nearest hundredth if necessary.

A. y-int.: (0,-7)
x-int.: (12.27,0) and (-14.27,0)

B. y-int.: (0,-7)
x-int.: (0.66,0) and (-2.66,0)

C. y-int.: (-7,0)
x-int.: (0,12.27) and (0,-14.27)

D. y-int.: (-7,0)
x-int.: (0,0.66) and (0,-2.66)

93. Does the relation represent a function? {(9,2), (-3,4), (2,7), (-1,2)}

A. Yes B. No C. Not enough information

Solutions

1. B	15. C	29. C	43. D	57. A	71. A	85. B
2. C	16. A	30. D	44. C	58. D	72. B	86. C
3. A	17. A	31. B	45. B	59. B	73. A	87. C
4. D	18. C	32. B	46. C	60. D	74. B	88. A
5. C	19. B	33. D	47. C	61. C	75. C	89. C
6. A	20. B	34. A	48. D	62. B	76. D	90. A
7. A	21. A	35. B	49. B	63. C	77. C	91. B
8. B	22. B	36. D	50. A	64. B	78. B	92. B
9. D	23. D	37. A	51. C	65. A	79. A	93. A
10. C	24. C	38. D	52. C	66. B	80. B	
11. D	25. B	39. D	53. B	67. B	81. C	
12. D	26. D	40. B	54. C	68. A	82. B	
13. D	27. D	41. C	55. B	69. D	83. A	
14. B	28. D	42. B	56. C	70. C	84. D	