Middlesex County College
Final Exam Review
Algebra 1, MAT 013

1. Evaluate $\frac{2m-7n}{m+n}$ when $m = 7$ and $n = -1$.

   a. -1 b. $\frac{7}{6}$ c. 9 d. $\frac{7}{2}$

2. Evaluate for $x = -1$: $x^2 - 2x + 5$

   a. 2 b. 4 c. 8 d. 6

3. Simplify: $3y - 14(5y - 4)$

   a. $4 - 67y$ b. $56 - 67y$ c. $63y$ d. $56 - 28y$

4. Solve the equation: $\frac{2}{3}x = -\frac{1}{5}$

   a. $x = \frac{13}{15}$ b. $x = -\frac{2}{15}$ c. $x = -\frac{3}{10}$ d. $x = \frac{3}{10}$

5. Solve the equation: $\frac{5}{2}y + 11 = -1$

   a. $y = -\frac{24}{5}$ b. $y = 4$ c. $y = -30$ d. $y = \frac{12}{5}$

6. Solve the equation: $4x = 6x + 30$

   a. $x = 3$ b. $x = -15$ c. $x = 15$ d. $x = -17$

7. Solve the equation: $3(2x + 10) - 32 = 6 + 2(3x - 4)$

   a. $x = 2$ b. $x = 0$ c. no solution d. all real numbers

8. Marcus made $21 more than three times Joel's weekly salary. If x represents Joel's weekly salary, write an expression for Marcus' weekly salary.

   a. $21x + 3$ b. $3x + 21$ c. $(3x + 21)$ d. $21(3 + x)$

9. The plans for a rectangular deck call for the width to be 6 feet less than the length. Sam wants the deck to have an overall perimeter of 44 feet. What should the ***length*** of the deck be?

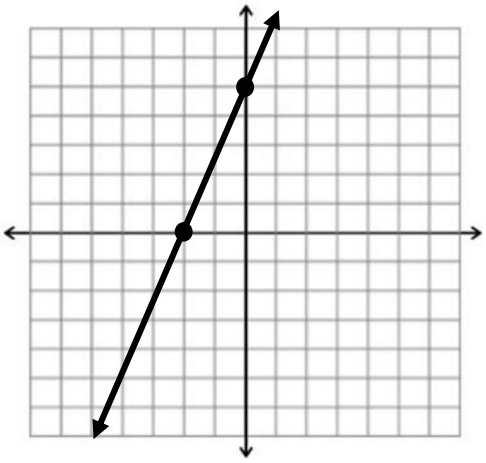
a. 6 feet b. 8 feet c. 20 feet d. 14 feet

10. Find the x- and y- intercepts: $3x - 2y = 12$

a. x-int: $(4, 0)$ y-int: $(0, -6)$
b. x-int: $(-4, 0)$ y-int: $(0, 6)$
c. x-int: $(6, 0)$ y-int: $(0, -4)$
d. x-int: $(6, 0)$ y-int: $(0, 4)$

11. Which is the graph of $5x + 2y = 10$?

a.



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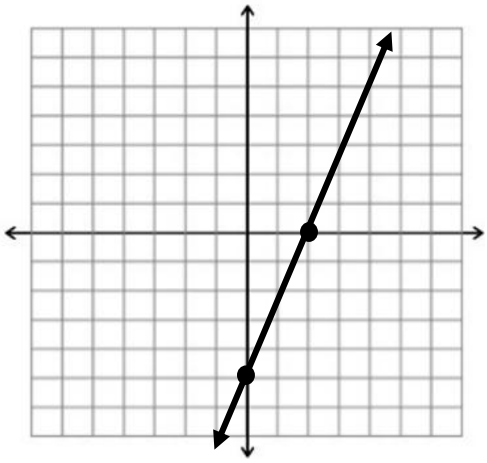

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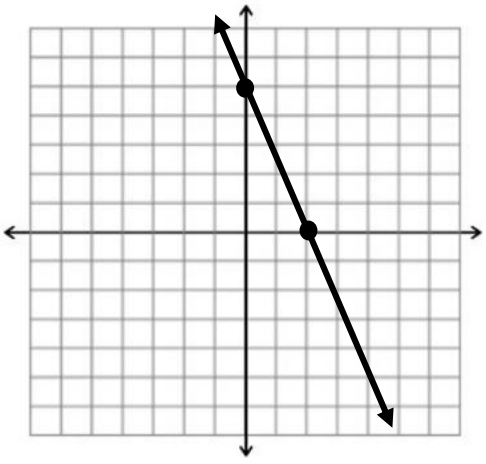

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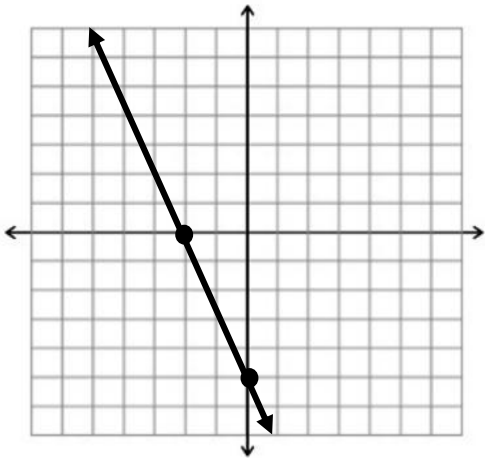


12. Find x so that $(x, 6)$ is a solution to $2x + 3y = 12$

a. $x = -6$ b. $x = 30$ c. $x = 15$ d. $x = -3$

13. Write the equation of a vertical line that goes through the point (–36, 27).

a. $y = -36$ b. $y = 27$ c. $x = -36$ d. $x = 27$

14. Write the equation of a horizontal line that goes through the point (–36, 27).

a. $y = -36$ b. $y = 27$ c. $x = -36$ d. $x = 27$

15. Find the slope of the line containing the points (0, –7) and (3, 0).

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

16. The price, in dollars, of a gallon of gas for the ten-week period after August 1 can be approximated by the equation $p = 0.03w + 1.13$ where w is the number of weeks after August 1. Find the p-intercept, and interpret its meaning in the context of this problem.

a. $(0.03, 0)$; The price is rising by \$0.03/week.
b. $(0, 1.13)$; The price on August 1 was \$1.13.
c. $(-37.67, 0)$; It takes 37.67 gallons to fill the gas tank.
d. $(0, -0.03)$; The price on August 1 was \$0.03 less than ten weeks later.

17. Write an equation of the line with slope 12 that goes through the point (–1, 4).

a. $y = 12x + 4$ b. $y = 12x - 1$ c. $y = 12x + 16$ d. $y = -3x + 12$

18. Solve the system of equations: $\begin{cases} y = -3x + 12 \\ 8x + 3y = 35 \end{cases}$

a. $(1, 9)$ b. $(-1, 15)$ c. $(9, -15)$ d. $(8, 3)$

19. Solve the system of equations: $\begin{cases} -20x - 4y = -20 \\ 5x + y = 6 \end{cases}$

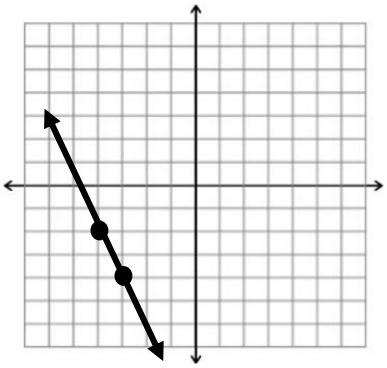
a. no solution b. infinitely many solutions c. $(1, 0)$ d. $(0, 6)$

20. Solve the system of equations for y: $\begin{cases} 3x + 8y = 15 \\ 3x - y = 15 \end{cases}$

a. $y = -15$ b. $y = 5$ c. $y = 0$ d. $y = 3$

21. Graph the line containing (–3, –4) with slope $m = 2$.

a.



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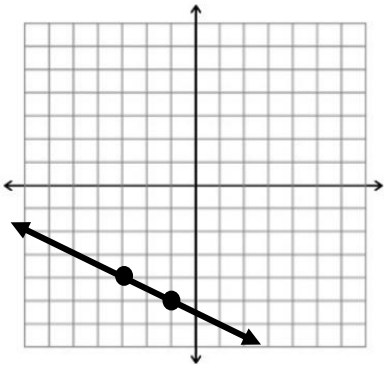

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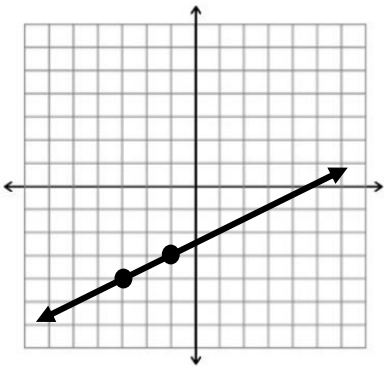

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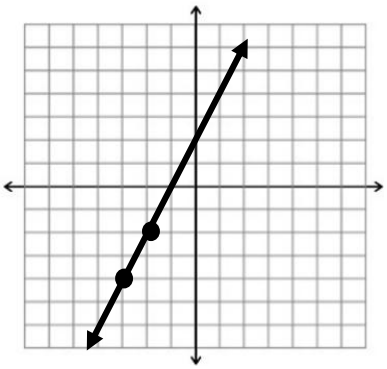
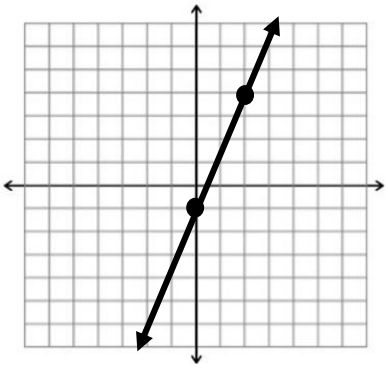


22. Graph $y = -\frac{5}{2}x - 1$

a.



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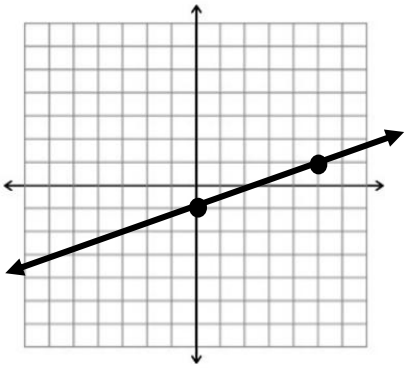

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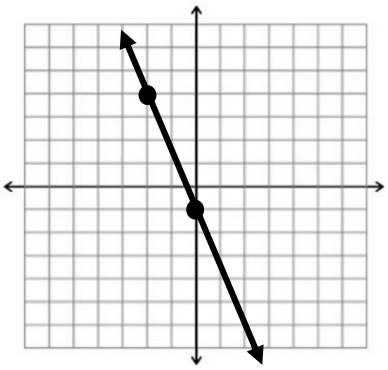

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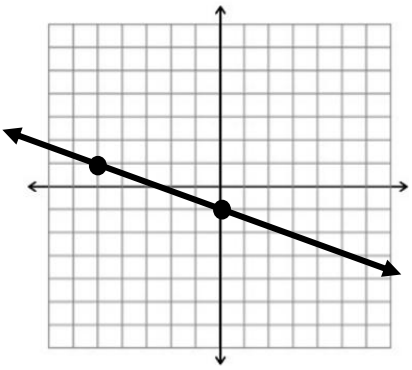


23. At one store, 5 pairs of jeans and 2 sweatshirts cost \$208, while 3 pairs of jeans and 4 sweatshirts cost \$178. Find the cost of one sweatshirt.

a. \$19 b. \$34 c. \$16 d. \$36

24. Simplify: $(-7x^4)(6x^{12})$

a. $-42x^{48}$ b. $-42x^{16}$ c. $\frac{6x^8}{7}$ d. $42x^8$

25. Simplify: $(7y^6)^2(2y^8)^4$

a. $784y^{44}$ b. $14y^{44}$ c. $784y^{384}$ d. $14y^{14}$

26. Simplify: $\left(\frac{2x^8y^8}{x^6y^7}\right)^3$

a. $8x^6y^3$ b. $2x^{18}y^{17}$ c. $8x^2y$ d. $2x^6y^3$

27. Evaluate: 2^{-4}

a. $\frac{1}{16}$ b. -8 c. $\frac{1}{8}$ d. $-\frac{1}{16}$

28. Simplify: y^{-5}

a. $-5y$ b. $y-5$ c. $\frac{1}{y^5}$ d. $-\frac{1}{y^5}$

29. Simplify: $\frac{x^2}{x^7}$

a. x^5 b. $\frac{1}{x^5}$ c. x^9 d. $-x^5$

30. Simplify: $\left(\frac{14x^3y^8}{7x^7y^3}\right)^2$

a. $\frac{2y^2}{x^4}$ b. $\frac{2y^{10}}{x}$ c. $\frac{4y^{10}}{x^8}$ d. $4x^8y^{10}$

31. Perform the indicated operation(s): $(-4a^2b + 3ab^2 + ab) - (2a^2b - 3ab^2 - 5ab)$

a. $-6a^2b - 4ab$
b. $-6a^2b + 6ab^2 + 6ab$
c. $2a^2b + 6ab^2 - 4ab$
d. $-6a^4b^2 - 4a^2b^2$

32. Multiply: $3x^2y^3(-5x^2y - 3xy^2 - 2x + 9)$

a. $-15x^4y^4 - 3xy^2 - 2x + 9$
b. $-15x^4y^4 - 9x^2y^6 - 6x^3y^3 + 27x^2y^3$
c. $-15x^4y^4 - 9x^3y^6 - 6x^3y^3 - 27x^2y^3$
d. $-15x^4y^4 - 9x^3y^5 - 6x^3y^3 + 27x^2y^3$

33. Multiply: $(10x + 5)(x^2 - 2x + 2)$

a. $10x^3 - 10x^2 + 2$
b. $10x^3 - 20x^2 + 20x + 10$
c. $10x^3 - 15x^2 + 10x + 10$
d. $11x^2 - 20x + 10$

34. Multiply: $(p + 11)^2$

a. $p^2 + 121$
b. $p^2 + 11p + 121$
c. $p^2 + 22p + 121$
d. $p^2 + 22$

35. Divide: $\frac{9x^4 - 21x^3 - 18x^2 + 6x}{3x}$

a. $3x^3 - 21x^3 - 18x^2 + 6x$
b. $3x^3 - 7x^2 - 6x + 2$
c. $9x^4 - 21x^3 - 18x^2 + 2$
d. $9x^4 - 25x^2 + 6x$

36. Factor completely: $5xy + 10x - 20y - 40$

a. $5(x + 4)(y - 2)$
b. $5(x + 2)(y - 4)$
c. $5(x - 4)(y + 2)$
d. $5(x - 2)(y + 4)$

37. Factor completely: $x^2 - 36$

a. $(x - 6)^2$
b. $(x + 6)^2$
c. $(x - 9)(x + 4)$
d. $(x - 6)(x + 6)$

38. Which of the following is a factor of $y^2 - 16y + 60$?

a. $(y + 10)$
b. $(y - 10)$
c. $(y + 6)$
d. $(y - 15)$

39. Which of the following is a factor of $c^2 + 4c - 96$?

a. $(c - 8)$ b. $(c - 16)$ c. $(c - 12)$ d. $(c + 6)$

40. Factor completely: $7x^3 - 63x^2 + 98x$

a. $7(x^2 - 2)(x - 7)$
b. $(x^2 - 7)(7x - 2)$
c. $7x(x - 2)(x - 7)$
d. $x(7x - 2)(x - 7)$

41. Solve the equation: $4x^2 + 32x = 0$

a. $x = -8, 4$ b. $x = 8, 0$ c. $x = 8, -4$ d. $x = -8, 0$

42. Simplify: $\frac{36x^4}{33x^{11}}$

a. $\frac{12}{11x^{15}}$ b. $\frac{3}{x^7}$ c. $3x^7$ d. $\frac{12}{11x^7}$

43. Simplify: $\frac{y^2+4y-21}{y^2-9}$

a. $\frac{4y-21}{9}$ b. $\frac{y+7}{y-3}$ c. $\frac{y+7}{y+3}$ d. $\frac{4y-7}{3}$

44. Multiply: $\frac{60x^5}{y^2} \cdot \frac{y^5}{15x}$

a. $\frac{4x^4}{y^3}$ b. $4x^4y^3$ c. $\frac{x^4y^3}{4}$ d. $\frac{y^3}{4x^4}$

45. Multiply and simplify: $\frac{x+2}{2x^2+9x+10} \cdot \frac{4x+10}{20}$

a. $\frac{2x+11}{5}$ b. $\frac{1}{10}$ c. $\frac{4x}{11x+7}$ d. $\frac{4x+2}{x+5}$

MIDDLESEX COUNTY COLLEGE

46. Divide and simplify: $\frac{x^2-7x-18}{x^2-12x+27} \div \frac{4x^2+8x}{x^2-9}$

a. $\frac{x+3}{4x}$ b. $\frac{-7x-11}{20x+3}$ c. $\frac{x-2}{x+2}$ d. $-\frac{16}{7+14x}$

47. Find the LCD of the fractions: $\frac{5}{12x^2}, \frac{4}{9x^4}$

a. $36x^4$ b. $36x^8$ c. $108x^8$ d. $3x^2$

48. Add: $\frac{15x}{9x+16} + \frac{7}{9x+16}$

a. $\frac{105x}{9x+16}$ b. $\frac{15x+7}{9x+16}$ c. $\frac{22x}{9x+16}$ d. $\frac{105x}{18x+32}$

49. Subtract: $\frac{x}{x+2} - \frac{9}{x-10}$

a. $\frac{x^2-19x-18}{x^2-8x-20}$ b. $\frac{x-9}{x^2-8x-20}$ c. $\frac{-19x-9}{-8x-10}$ d. $\frac{x^2-10x}{x^2-8x-20}$

50. Solve the formula for y: $ax + by = c$

a. $y = \frac{c}{b} - ax$ b. $y = \frac{c}{ax} - b$ c. $y = \frac{c+b}{ax}$ d. $y = \frac{c-ax}{b}$

51. Simplify: $\sqrt{60}$

a. $2\sqrt{15}$ b. $4\sqrt{15}$ c. $2\sqrt{30}$ d. $15\sqrt{2}$

52. Simplify the expression. Assume the variable represents a positive real number.

$$\sqrt{x^{14}}$$

a. x^2 b. x^7 c. x^{13} d. x

53. Simplify the expression. Assume the variable represents a positive real number.

$$\sqrt{90y^{15}}$$

a. $y^{30}\sqrt{90}$ b. $9y^7\sqrt{10}$ c. $3y^7\sqrt{y}$ d. $3y^7\sqrt{10y}$

54. Simplify the expression. Assume the variable represents a positive real number.

$$\sqrt{175a^{17}b^{7}}$$

a. $7a^{16}b^{6}\sqrt{5ab}$ b. $5a^{8}b^{3}\sqrt{7ab}$ c. $5a^{16}b^{6}\sqrt{7ab}$ d. $7a^{8}b^{3}\sqrt{5ab}$

55. Add: $7\sqrt{2}+\sqrt{98}$

a. 28 b. 70 c. $14\sqrt{2}$ d. $7\sqrt{2}$

56. Perform the operations and simplify: $\sqrt{27}-\sqrt{75}+\sqrt{108}$

a. $\sqrt{60}$ b. $4\sqrt{3}$ c. $3\sqrt{3}-3\sqrt{5}+3\sqrt{6}$ d. $-8\sqrt{3}$

57. You've decided to enroll in a local community college as a part-time student (taking fewer than 12 credit hours). The cost per credit at your college is $138.50.

a. What is the cost of a 4-credit-hour math class?

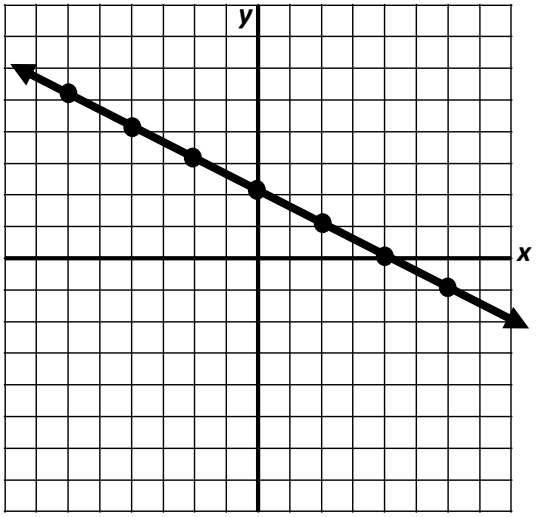
b. Write an equation to determine the total tuition (y) for a given number of credit hours (x).

c. Complete the following table.

Credit Hours (x)	Tuition Paid (y)
6	
	$1246.50
11	

58. Consider the graph of the line below.

a. State the slope of the line.
b. State the x-intercept as an ordered pair.
c. State the y-intercept as an ordered pair.
d. Write the equation of the line in the form $y = mx + b$.



Solutions:

1. d
2. c
3. b
4. c
5. a
6. b
7. d
8. b
9. d
10. a
11. c
12. d
13. c
14. b
15. a
16. b
17. c
18. a
19. a
20. c
21. d
22. c
23. a
24. b
25. a
26. a
27. a
28. c
29. b
30. c
31. b
32. d
33. c
34. c
35. b
36. c
37. d
38. b
39. a
40. c
41. d
42. d
43. c
44. b
45. b
46. a
47. a
48. b
49. a
50. d
51. a
52. b
53. d
54. b
55. c
56. b
57. a. \$554, b. $y = 138.50x$

Credit Hours	Tuition Paid ($)
6	\$831
9	\$1246.50
11	\$1523.50

58. a. m = -½
    b. x-intercept: (4, 0)
    c. y-intercept: (0, 2),
    d. equation: $y = -\frac{1}{2}x + 2$