

# MIDDLESEX COUNTY COLLEGE

## MAT 014A FINAL REVIEW

1. Simplify.

$$(-4zp^5u^3)^3$$

[A]  $-12z^4p^8u^6$

[B]  $-64z^3p^{15}u^9$

[C]  $-64z^4p^{15}u^6$

[D]  $-12z^3p^8u^9$

2. Simplify the expression by combining like terms.

$$7x + 6(x + 5) - 2(x - 3)$$

[A]  $11x + 2$

[B]  $11x + 36$

[C]  $15x + 24$

[D]  $11x + 24$

3. Evaluate  $3cd + c^2$  when  $c = -3$  and  $d = -4$ .

[A] 45

[B] -45

[C] -1089

[D] 1089

4. Simplify.

$$(x^2 - 7x + 10) + (3x^2 - 14x + 33) - (x^2 + 4x - 4)$$

[A]  $3x^2 - 17x + 39$

[B]  $3x^2 - 25x + 47$

[C]  $5x^2 - 25x + 47$

[D]  $5x^2 - 17x + 39$

5. Simplify.

$$(5x + 2y)^2$$

[A]  $25x^2 + 10xy + 4y^2$

[B]  $25x^2 + 4y^2$

[C]  $25x^2 + 20xy + 4y^2$

[D]  $25x^2 + 14xy + 4y^2$

6. Simplify.

$$(3x + 7y)(3x - 7y)$$

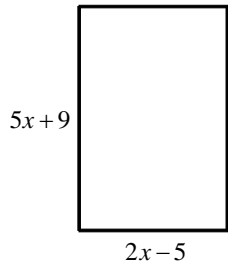
[A]  $9x^2 - 49y^2$

[B]  $9x^2 + 49y^2$

[C]  $9x^2 + 42x - 49y^2$

[D]  $9x^2 - 42x + 49y^2$

7. Find the area of the rectangle written as a simplified polynomial.



- [A]  $7x^2 + 4x - 45$       [B] None of these      [C]  $7x^2 - 7x + 45$       [D]  $14x + 8$

8. Factor.

$$12x^2 - 42x^5$$

- [A]  $x^2(12 - 42x^3)$       [B]  $6(2x^2 - 7x^5)$       [C]  $6x^2(2 - 7x^3)$       [D]  $6x(x - 7x^4 + 5)$

9. Factor.

$$2x^2 - 14x - 2x + 14$$

- [A]  $(2x - 6)(2x - 2)$       [B]  $2x(x - 7)(x - 1)$       [C]  $x(2x - 6)(2x - 2)$       [D]  $2(x - 7)(x - 1)$

10. Factor.

$$4x^2 - 9y^2$$

- [A]  $(2x + 3)(2x - 3)$       [B]  $(2x - 3y)^2$       [C]  $(2x + 3y)(2x - 3y)$       [D]  $(2x + 3y)^2$

11. Factor.

$$4x^2 - 13x + 3$$

- [A]  $(x - 3)(4x - 1)$       [B]  $(x + 3)(4x + 1)$       [C]  $(4x - 3)(x - 1)$       [D]  $(4x + 3)(x + 1)$

12. Factor.

$$c^2 - 8c + 16$$

- [A]  $(c + 4)^2$       [B]  $(c - 4)^2$       [C]  $(c - 16)(c + 1)$       [D]  $(c - 4)(c + 4)$

13. Factor completely.

$$3x^3 - 3x^2 - 6x$$

- [A]  $-(x + 1)(x - 2)$       [B]  $-3x(x + 1)(x - 2)$       [C]  $3x(x + 1)(x - 2)$       [D]  $(x + 1)(x - 2)$

14. Solve the equation and check your solution.

$$3(x-2)+4=4(x-2)+1$$

- [A] 3                                      [B] 5                                      [C] -17                                      [D] -7

15. Solve the equation.

$$\frac{x+2}{3} - \frac{x-2}{5} = 4$$

- [A] -6                                      [B] 28                                      [C] 22                                      [D] 0

16. Solve.

$$2x(7x-2)=0$$

- [A] 0,  $-\frac{7}{2}$                                       [B] 0,  $\frac{2}{7}$                                       [C] -2,  $-\frac{2}{7}$                                       [D] -2,  $\frac{7}{2}$

17. Solve:

$$x^2 - 17x + 72 = 0$$

- [A] -9, -8                                      [B] -9, 8                                      [C] -8, 9                                      [D] 8, 9

18. The length of a rectangle is 16 centimeters less than four times its width. If the area is 20 square centimeters, find the length and width.

- [A] Length: 6 cm; Width: 4 cm                                      [B] Length: 5 cm; Width: 5 cm  
[C] Length: 4 cm; Width: 6 cm                                      [D] Length: 4 cm; Width: 5 cm

19. Find the distance between the points  $(-3, -4)$  and  $(-7, -4)$ .

- [A] 10                                      [B] 8                                      [C] 4                                      [D] 18

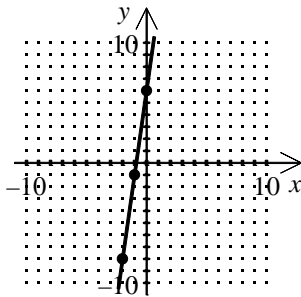
20. Find the midpoint of the segment connecting  $(13, -15)$  and  $(-12, 12)$ .

- [A]  $\left(\frac{25}{2}, -\frac{27}{2}\right)$                                       [B]  $(-1, 3)$                                       [C]  $\left(\frac{1}{2}, -\frac{3}{2}\right)$                                       [D]  $(1, -3)$

21. Which shows the completed table and graph of the linear equation  $-7x + y = 6$ ?

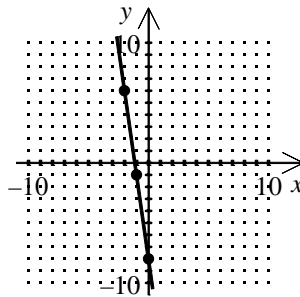
[A] 

$x$	-2	-1	0
$y$	6	-1	-8



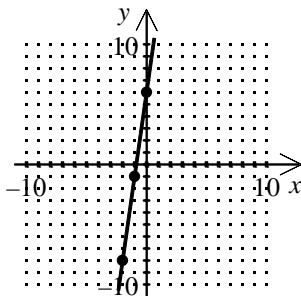
[B] 

$x$	-2	-1	0
$y$	-8	-1	6



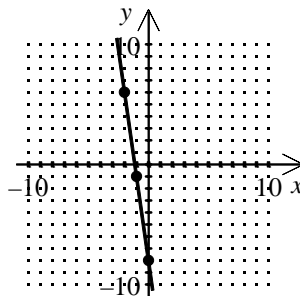
[C] 

$x$	-2	-1	0
$y$	-8	-1	6



[D] 

$x$	-2	-1	0
$y$	6	-1	-8



22. Find the slope of the line that contains  $(-7, -5)$  and  $(-4, -6)$ .

- [A] -3                      [B]  $-\frac{1}{3}$                       [C] -13                      [D] 1

23. Which best describes the relationship between the lines with equations  $8x + y = 6$  and  $16x + 2y = 0$ ?

- [A] Perpendicular      [B] Parallel      [C] Same line      [D] Neither parallel nor perpendicular

24. Which relation has domain  $\{-8, 7, -7\}$  and range  $\{-7, -1, 6\}$ ?

- [A]  $\{(-8, -7), (7, -1), (-7, 6)\}$                       [B]  $\{(-7, -8), (-1, 7), (6, -7)\}$   
 [C]  $\{-7, -1, 6\}$                       [D]  $\{-8, 7, -7\}$

25. Determine which relation is a function.

[A]

$x$	$y$
-8	5
-7	3
-8	1

[B]  $\{(9, 1), (3, 1), (2, 4), (4, 9)\}$

[C]

$x$	$y$
-9	5
-8	3
-8	1

[D]

$x$	$y$
-7	5
-7	3
-8	1

26. Find  $f(-2)$  given that  $f(x) = 4x^2 - 2x - 25$ .

[A] -5

[B] 20

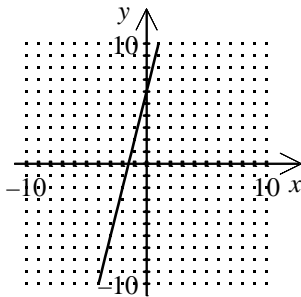
[C] -29

[D] -17

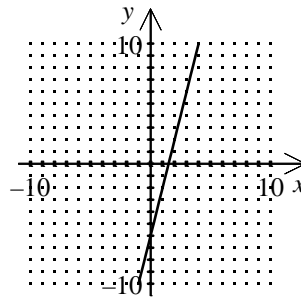
27. Graph the linear equation:

$$y = -4x + 6$$

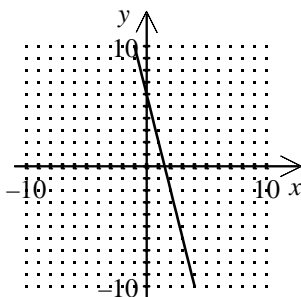
[A]



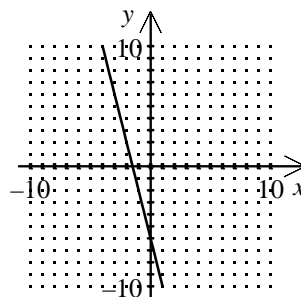
[B]



[C]



[D]



28. Determine the domain of the function.

$$f(x) = \frac{2}{6-x}$$

[A] All real numbers  $x \neq -6$

[B] All real numbers  $x \neq -2$

[C] All real numbers  $x \neq 0$

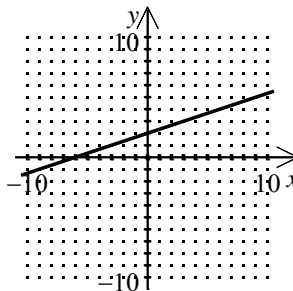
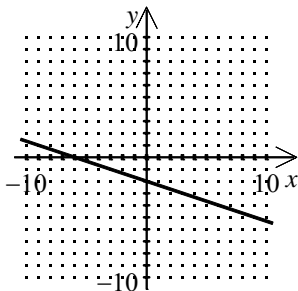
[D] All real numbers  $x \neq 6$

29. Rewrite the equation in slope-intercept form. Then graph the equation.

$$-x + 3y = 6$$

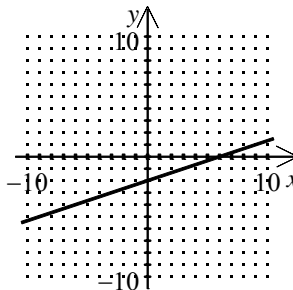
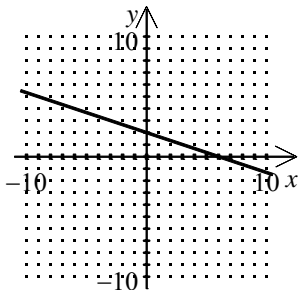
[A]  $y = -\frac{1}{3}x - 2$

[B]  $y = \frac{1}{3}x + 2$



[C]  $y = -\frac{1}{3}x + 2$

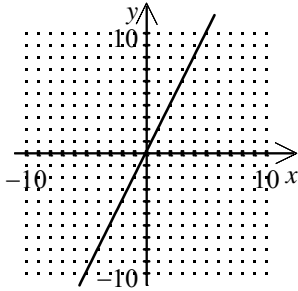
[D]  $y = \frac{1}{3}x - 2$



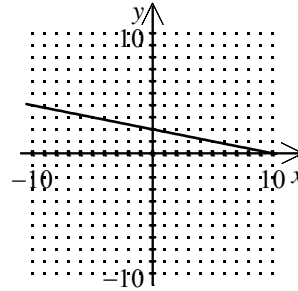
30. Sketch the graph of the function.

$$f(x) = \frac{1}{5}x + 2$$

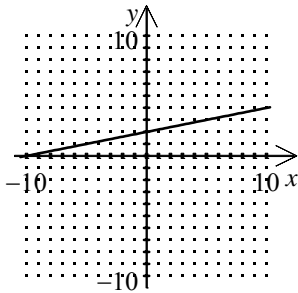
[A]



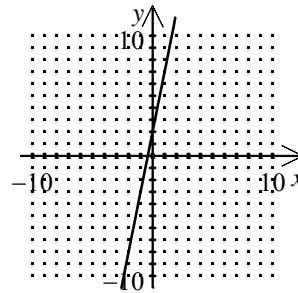
[B]



[C]

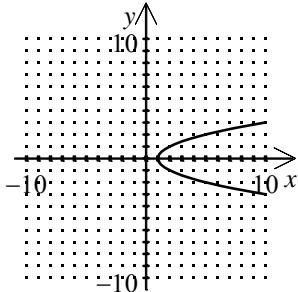


[D]

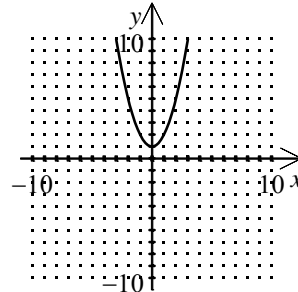


31. Use the Vertical Line Test to determine which graph does *not* represent  $y$  as a function of  $x$ .

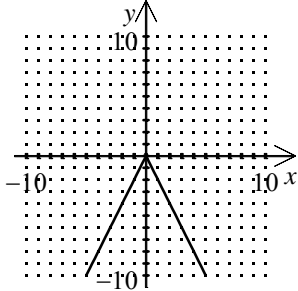
[A]



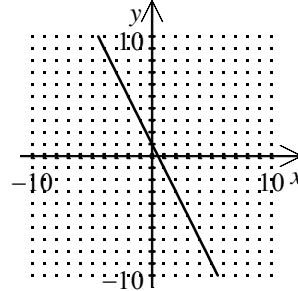
[B]



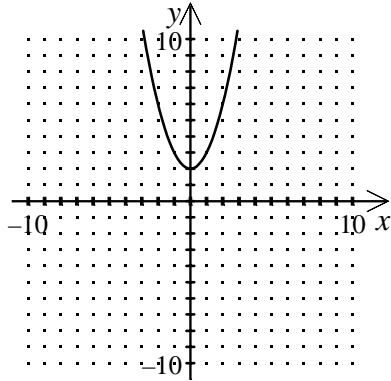
[C]



[D]



32. Find the domain and range of the function.



[A] Domain:  $\{x \mid x \text{ is a real number}\}$

Range:  $\{y \mid y \geq 2\}$

[C] Domain:  $\{x \mid x > 2\}$

Range:  $\{y \mid y > 2\}$

[B] Domain:  $\{x \mid x \text{ is a real number}\}$

Range:  $\{y \mid y \text{ is a real number}\}$

[D] Domain:  $\{y \mid y \leq 2\}$

Range:  $\{y \mid y \text{ is a real number}\}$

33. Which is the equation of a vertical line through  $(-8, 10)$ ?

[A]  $y = -8$

[B]  $x = 10$

[C]  $x = -8$

[D]  $y = 10$

34. Find the point-slope form of an equation of the line that passes through the given point and has the given slope.

$(-3, -2), m = \frac{1}{2}$

[A]  $y + 2 = \frac{1}{2}(x - 3)$

[B]  $y - 2 = \frac{1}{2}(x + 3)$

[C]  $y - 2 = \frac{1}{2}(x - 3)$

[D]  $y + 2 = \frac{1}{2}(x + 3)$

35. Which is the equation in slope-intercept form of the line that is perpendicular to  $y = \frac{10}{9}$  and contains  $(2, 8)$ ?

[A]  $y = 2$

[B]  $x = 8$

[C]  $x = 2$

[D]  $y = 8$

36. Translate into a variable expression.  
the quotient of  $s$  and the difference between 4 and  $s$

[A]  $\frac{s}{4 - s}$

[B]  $(4 - s)^s$

[C]  $\frac{s - 4}{s}$

[D]  $s(4 - s)$

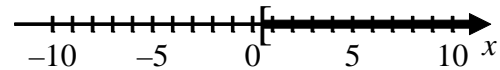
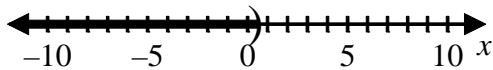
37. The sum of three consecutive odd integers is 483. What is the largest of the three integers?  
 [A] 163                      [B] 159                      [C] 162                      [D] None of these
38. The daily cost of renting a car is \$30 plus \$0.10 per mile. If John paid \$52.50 for a 1-day rental, how many miles did John travel?  
 [A] 23                      [B] 825                      [C] 525                      [D] 225
39. Train A leaves a station traveling at 48 kilometers per hour. Two hours later, train B leaves the same station traveling in the same direction at 58 kilometers per hour. How long does it take train B to catch up to train A?  
 [A] 8.6 hr                      [B] 9.6 hr                      [C] 7.6 hr                      [D] 10.6 hr

40. Solve the inequality and sketch the solution on the real number line.

$$4x - 3 \geq 2(x - 1)$$

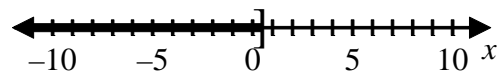
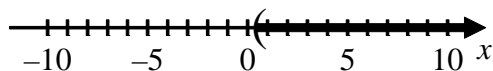
[A]  $x < \frac{1}{2}$

[B]  $x \geq \frac{1}{2}$



[C]  $x > \frac{1}{2}$

[D]  $x \leq \frac{1}{2}$



41. Solve the inequality.  
 $-15 \leq 3x + 12 \leq 12$

[A]  $24 \leq x \leq -3$

[B]  $-9 \leq x \leq 0$

[C]  $0 \leq x \leq -9$

[D]  $-3 \leq x \leq 24$

42. Solve the equation.

$$|x + 8| = 9$$

[A] 1, -17

[B] 17, -1

[C] -1

[D]  $\emptyset$

43. Solve the inequality.

$$|3x + 4| > 4$$

[A]  $-\frac{8}{3} < x < 0$

[B]  $-\frac{8}{3} \leq x \leq 0$

[C]  $x \leq -\frac{8}{3}$  or  $x \geq 0$

[D]  $x < -\frac{8}{3}$  or  $x > 0$

44. Solve the system of equations using substitution.

$$\begin{cases} 3x + 2y = -7 \\ -x + y = 4 \end{cases}$$

[A]  $(-3, -1)$

[B]  $(-3, 1)$

[C]  $(1, -5)$

[D]  $(-2, 6)$

45. Solve the system of equations using elimination.

$$\begin{cases} 2x - 5y = 5 \\ 5x + 4y = -4 \end{cases}$$

[A]  $\left(0, -\frac{10}{11}\right)$

[B]  $\left(\frac{3}{11}, \frac{10}{11}\right)$

[C]  $(0, -1)$

[D] No solution