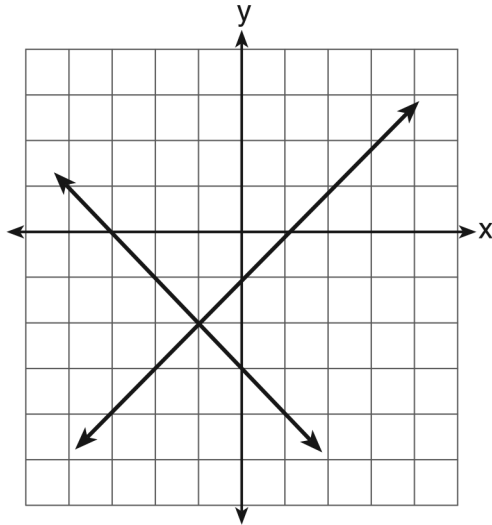


Bardunias - Per. 6 Midterm Review

Name: _____

Date: _____

1. What is the solution of the system of equations shown in the graph below?



- A. (1, 0) and (-3, 0)
- B. (0, -3) and (0, -1)
- C. (-1, -2)
- D. (-2, -1)

2. The solution of the equation $5 - 2x = -4x - 7$ is

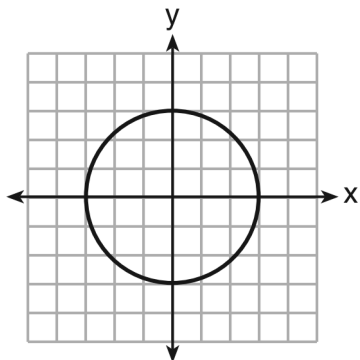
- A. 1 B. 2 C. -2 D. -6

3. The expression $100n^2 - 1$ is equivalent to

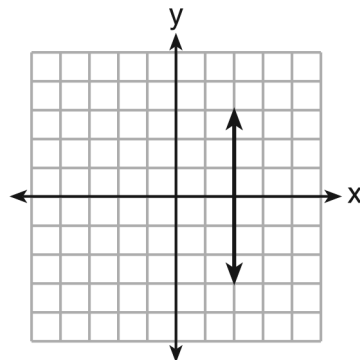
- A. $(10n + 1)(10n - 1)$
- B. $(10n - 1)(10n - 1)$
- C. $(50n + 1)(50n - 1)$
- D. $(50n - 1)(50n - 1)$

4. Which graph represents a function?

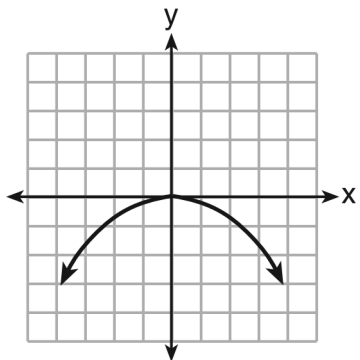
A.



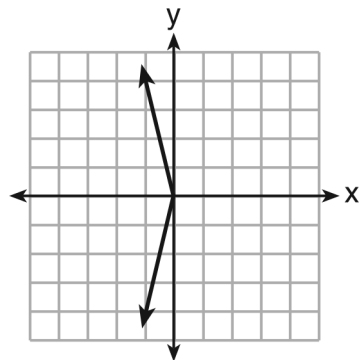
B.



C.



D.



5. The vertex of the parabola $y = x^2 + 8x + 10$ lies in Quadrant

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

6. What is $24x^2y^6 - 16x^6y^2 + 4xy^2$ divided by $4xy^2$?

A. $6xy^4 - 4x^5$
 B. $6xy^4 - 4x^5 + 1$
 C. $6x^2y^3 - 4x^6y$
 D. $6x^2y^3 - 4x^6y + 1$

7. The inequality $-2 \leq x \leq 3$ can be written as

- A. $(-2, 3)$ B. $[-2, 3)$
C. $(-2, 3]$ D. $[-2, 3]$

8. The roots of the equation $x^2 - 14x + 48 = 0$ are

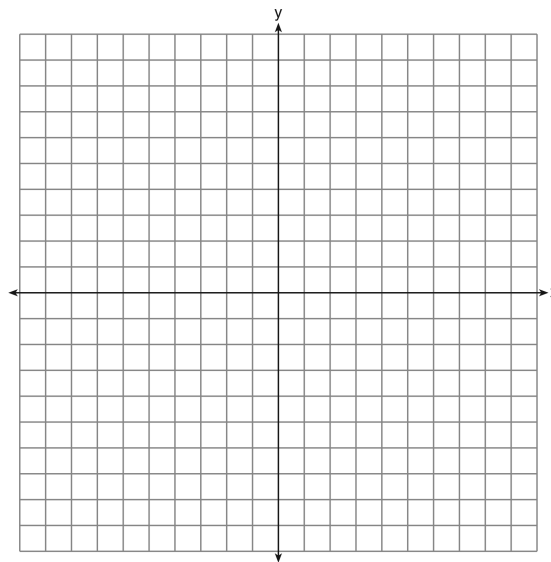
- A. -6 and -8 B. -6 and 8
C. 6 and -8 D. 6 and 8

9. If $x = -3$, what is the value of $|x - 4| - x^2$?

- A. -8 B. -2 C. 7 D. 16

10. Factor completely: $5x^3 - 20x^2 - 60x$

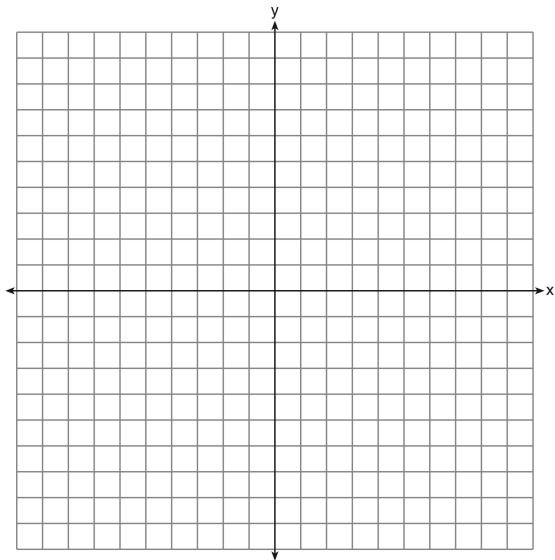
11. On the set of axes below, graph $y = 2|x + 3|$. Include the interval $-7 \leq x \leq 1$.



12. On the set of axes below, graph the following system of equations.

$$\begin{aligned}y + 2x &= x^2 + 4 \\ y - x &= 4\end{aligned}$$

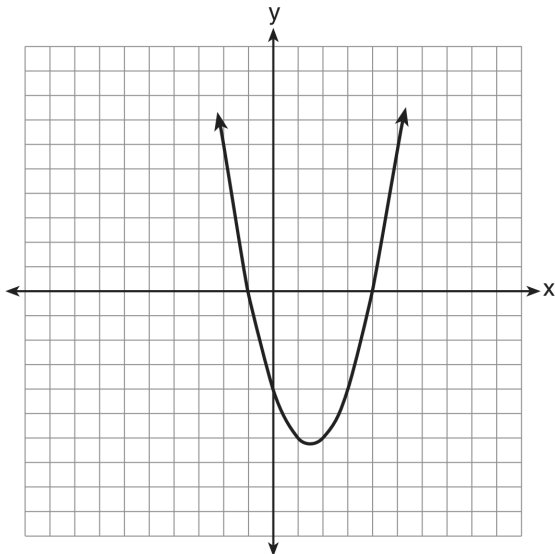
Using the graph, determine and state the coordinates of *all* points in the solution set for the system of equations.



1. If the point $(5, k)$ lies on the line represented by the equation $2x + y = 9$, the value of k is

A. 1 B. 2 C. -1 D. -2

2. The roots of a quadratic equation can be found using the graph below.



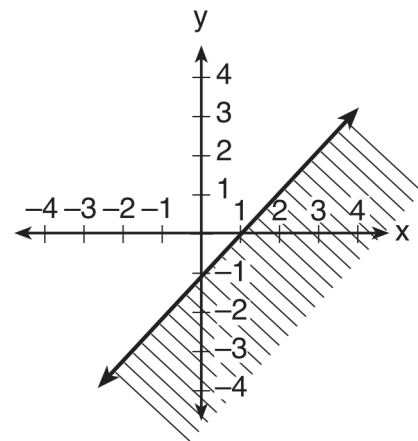
What are the roots of this equation?

- A. -4, only B. -4 and -1
C. -1 and 4 D. -4, -1, and 4

3. What is the slope of the line represented by the equation $4x + 3y = 12$?

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

4. The diagram below shows the graph of which inequality?



- A. $y > x - 1$ B. $y \geq x - 1$
C. $y < x - 1$ D. $y \leq x - 1$

5. When $2x^2 - 3x + 2$ is subtracted from $4x^2 - 5x + 2$, the result is

- A. $2x^2 - 2x$ B. $-2x^2 + 2x$
C. $-2x^2 - 8x + 4$ D. $2x^2 - 8x + 4$

6. If the roots of a quadratic equation are -2 and 3 , the equation can be written as

- A. $(x - 2)(x + 3) = 0$
- B. $(x + 2)(x - 3) = 0$
- C. $(x + 2)(x + 3) = 0$
- D. $(x - 2)(x - 3) = 0$

7. How many solutions are there for the following system of equations?

$$\begin{aligned}y &= x^2 - 5x + 3 \\y &= x - 6\end{aligned}$$

- A. 1 B. 2 C. 3 D. 0

8. The owner of a small computer repair business has one employee, who is paid an hourly rate of \$22. The owner estimates his weekly profit using the function $P(x) = 8600 - 22x$. In this function, x represents the number of

- A. computers repaired per week
- B. hours worked per week
- C. customers served per week
- D. days worked per week

9. How does the graph of $f(x) = 3(x - 2)^2 + 1$ compare to the graph of $g(x) = x^2$?

- A. The graph of $f(x)$ is wider than the graph of $g(x)$, and its vertex is moved to the left 2 units and up 1 unit.
- B. The graph of $f(x)$ is narrower than the graph of $g(x)$, and its vertex is moved to the right 2 units and up 1 unit.
- C. The graph of $f(x)$ is narrower than the graph of $g(x)$, and its vertex is moved to the left 2 units and up 1 unit.
- D. The graph of $f(x)$ is wider than the graph of $g(x)$, and its vertex is moved to the right 2 units and up 1 unit.

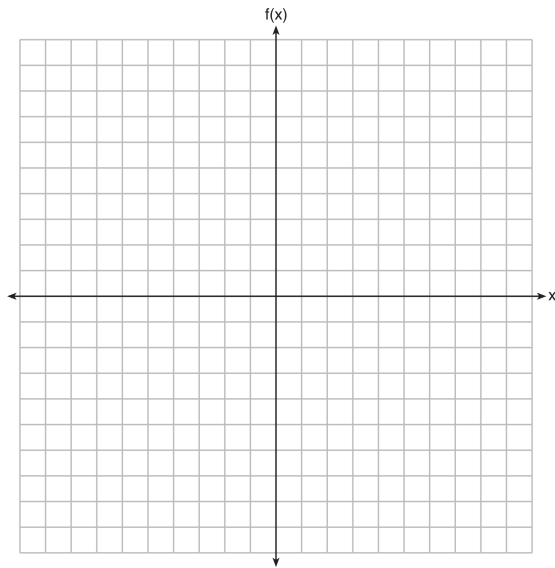
10. A function is shown in the table below.

x	$f(x)$
-4	2
-1	-4
0	-2
3	16

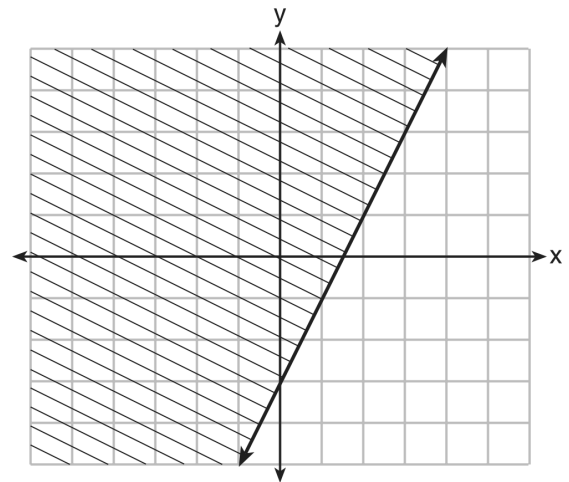
If included in the table, which ordered pair, $(-4, 1)$ or $(1, -4)$, would result in a relation that is no longer a function? Explain your answer.

11. Graph the following function on the set of axes below.

$$f(x) = \begin{cases} |x|, & -3 \leq x < 1 \\ 4, & 1 \leq x \leq 8 \end{cases}$$



12. The graph of an inequality is shown below.



- Write the inequality represented by the graph.
- On the same set of axes, graph the inequality $x + 2y < 4$.
- The two inequalities graphed on the set of axes form a system. Oscar thinks that the point $(2, 1)$ is in the solution set for this system of inequalities. Determine and state whether you agree with Oscar. Explain your reasoning.

13. Jacob and Zachary go to the movie theater and purchase refreshments for their friends. Jacob spends a total of \$18.25 on two bags of popcorn and three drinks. Zachary spends a total of \$27.50 for four bags of popcorn and two drinks.

Write a system of equations that can be used to find the price of one bag of popcorn and the price of one drink.

Using these equations, determine and state the price of a bag of popcorn and the price of a drink, to the *nearest cent*.

1. Which equation has the same solutions as $2x^2 + x - 3 = 0$?

A. $(2x - 1)(x + 3) = 0$
B. $(2x + 1)(x - 3) = 0$
C. $(2x - 3)(x + 1) = 0$
D. $(2x + 3)(x - 1) = 0$

2. Fred is given a rectangular piece of paper. If the length of Fred's piece of paper is represented by $2x - 6$ and the width is represented by $3x - 5$, then the paper has a total area represented by

A. $5x - 11$ B. $6x^2 - 28x + 30$
C. $10x - 22$ D. $6x^2 - 6x - 11$

3. Connor wants to attend the town carnival. The price of admission to the carnival is \$4.50, and each ride costs an additional 79 cents. If he can spend at most \$16.00 at the carnival, which inequality can be used to solve for r , the number of rides Connor can go on, and what is the maximum number of rides he can go on?

A. $0.79 + 4.50r \leq 16.00$; 3 rides
B. $0.79 + 4.50r \leq 16.00$; 4 rides
C. $4.50 + 0.79r \leq 16.00$; 14 rides
D. $4.50 + 0.79r \leq 16.00$; 15 rides

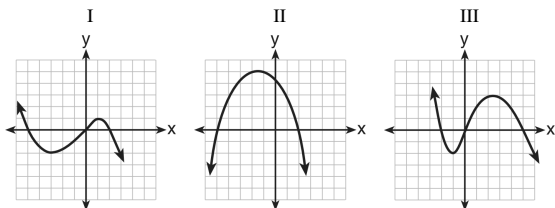
4. The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of r , in terms of h and V , is

A. $r = \sqrt{\frac{V}{\pi h}}$ B. $r = \sqrt{V\pi h}$
C. $r = 2V\pi h$ D. $r = \frac{V}{2\pi}$

5. Two functions, $y = |x - 3|$ and $3x + 3y = 27$, are graphed on the same set of axes. Which statement is true about the solution to the system of equations?

- A. $(3, 0)$ is the solution to the system because it satisfies the equation $y = |x - 3|$.
- B. $(9, 0)$ is the solution to the system because it satisfies the equation $3x + 3y = 27$.
- C. $(6, 3)$ is the solution to the system because it satisfies both equations.
- D. $(3, 0)$, $(9, 0)$, and $(6, 3)$ are the solutions to the system of equations because they all satisfy at least one of the equations.

6. A polynomial function contains the factors x , $x - 2$, and $x + 5$. Which graph(s) below could represent the graph of this function?



- A. I, only
- B. II, only
- C. I and III
- D. I, II, and III

7. Solve the equation $4x^2 - 12x = 7$ algebraically for x .

8. a) Given the function $f(x) = -x^2 + 8x + 9$, state whether the vertex represents a maximum or minimum point for the function. Explain your answer.
- b) Rewrite $f(x)$ in vertex form by completing the square.

9. The cost of airing a commercial on television is modeled by the function $C(n) = 110n + 900$, where n is the number of times the commercial is aired. Based on this model, which statement is true?

- A. The commercial costs \$0 to produce and \$110 per airing up to \$900.
- B. The commercial costs \$110 to produce and \$900 each time it is aired.
- C. The commercial costs \$900 to produce and \$110 each time it is aired.
- D. The commercial costs \$1010 to produce and can air an unlimited number of times.

10. If the area of a rectangle is expressed as $x^4 - 9y^2$, then the product of the length and the width of the rectangle could be expressed as

- A. $(x - 3y)(x + 3y)$
- B. $(x^2 - 3y)(x^2 + 3y)$
- C. $(x^2 - 3y)(x^2 - 3y)$
- D. $(x^4 + y)(x - 9y)$

11. Which table represents a function?

- A.

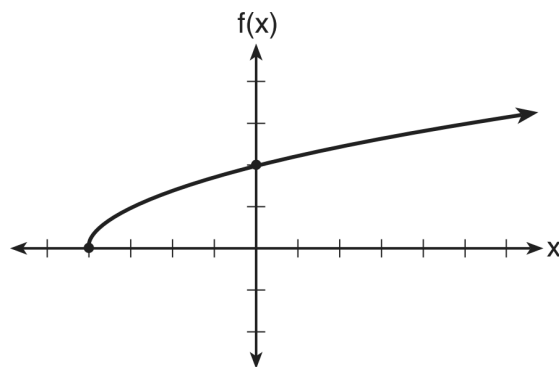
x	2	4	2	4
$f(x)$	3	5	7	9
- B.

x	0	-1	0	1
$f(x)$	0	1	-1	0
- C.

x	3	5	7	9
$f(x)$	2	4	2	4
- D.

x	0	1	-1	0
$f(x)$	0	-1	0	1

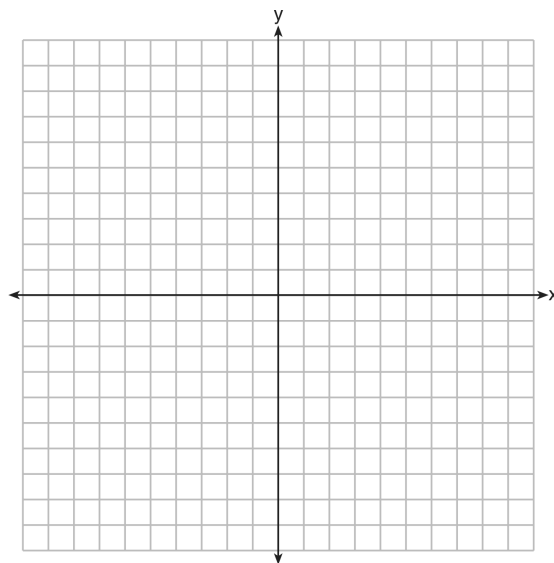
12. The graph of the function $f(x) = \sqrt{x + 4}$ is shown below.



The domain of the function is

- A. $\{x \mid x > 0\}$
- B. $\{x \mid x \geq 0\}$
- C. $\{x \mid x > -4\}$
- D. $\{x \mid x \geq -4\}$

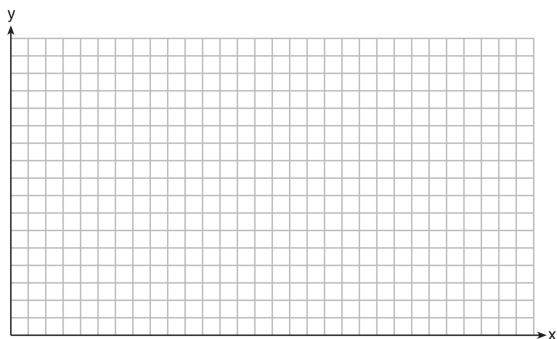
13. Graph the function $y = |x - 3|$ on the set of axes below.



Explain how the graph of $y = |x - 3|$ has changed from the related graph $y = |x|$.

14. A football player attempts to kick a football over a goal post. The path of the football can be modeled by the function $h(x) = -\frac{1}{225}x^2 + \frac{2}{3}x$, where x is the horizontal distance from the kick, and $h(x)$ is the height of the football above the ground, when both are measured in feet.

On the set of axes below, graph the function $y = h(x)$ over the interval $0 \leq x \leq 150$.



Determine the vertex of $y = h(x)$. Interpret the meaning of this vertex in the context of the problem.

The goal post is 10 feet high and 45 yards away from the kick. Will the ball be high enough to pass over the goal post? Justify your answer.

1.	[1.1]	15.	[2.3]
Answer:	C	Answer:	D
Points:	1	Points:	1
2.	[1.2]	16.	[2.4]
Answer:	D	Answer:	D
Points:	1	Points:	1
3.	[1.3]	17.	[2.5]
Answer:	A	Answer:	A
Points:	1	Points:	1
4.	[1.4]	18.	[2.6]
Answer:	C	Answer:	B
Points:	1	Points:	1
5.	[1.5]	19.	[2.7]
Answer:	C	Answer:	A
Points:	1	Points:	1
6.	[1.6]	20.	[2.8]
Answer:	B	Answer:	B
Points:	1	Points:	1
7.	[1.7]	21.	[2.9]
Answer:	D	Answer:	B
Points:	1	Points:	1
8.	[1.8]	22.	[2.10]
Answer:	D	Answer:	$(-4, 1)$
Points:	1	Points:	1
9.	[1.9]	23.	[2.11]
Answer:	B	Answer:	[graph]
Points:	1	Points:	1
10.	[1.10]	24.	[2.12]
Answer:	$5x(x + 2)(x - 6)$	Answer:	$y \geq 2x - 3$, [graph], disagree
Points:	1	Points:	1
11.	[1.11]	25.	[2.13]
Answer:	A correct graph is drawn that includes the given interval	Answer:	popcorn = \$5.75; drink = \$2.25
Points:	1	Points:	1
12.	[1.12]	26.	[3.1]
Answer:	Both equations are graphed correctly, and $(0, 4)$ and $(3, 7)$ are stated.	Answer:	D
Points:	1	Points:	1
13.	[2.1]	27.	[3.2]
Answer:	C	Answer:	B
Points:	1	Points:	1
14.	[2.2]	28.	[3.3]
Answer:	C	Answer:	C
Points:	1	Points:	1

29.	[3.4]
Answer:	A
Points:	1
30.	[3.5]
Answer:	C
Points:	1
31.	[3.6]
Answer:	A
Points:	1
32.	[3.7]
Answer:	$\frac{7}{2}$ and $-\frac{1}{2}$
Points:	1
33.	[3.8]
Answer:	maximum; $f(x) = -(x - 4)^2 + 25$
Points:	1
34.	[3.9]
Answer:	C
Points:	1
35.	[3.10]
Answer:	B
Points:	1
36.	[3.11]
Answer:	C
Points:	1
37.	[3.12]
Answer:	D
Points:	1
38.	[3.13]
Answer:	[answers vary] Correct graph and explanation
Points:	1
39.	[3.14]
Answer:	[answers vary] A correct graph is drawn, (75, 25) is stated and interpreted, no, and a correct justification is given.
Points:	1