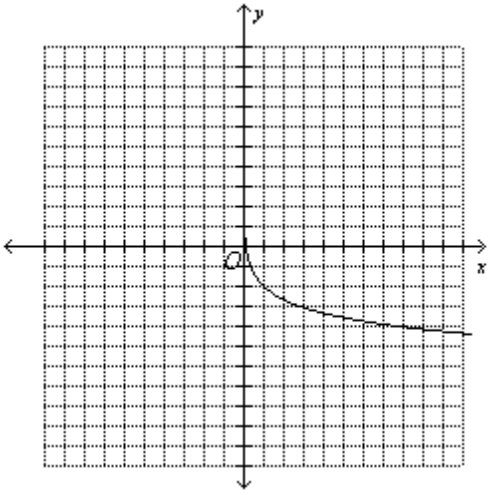
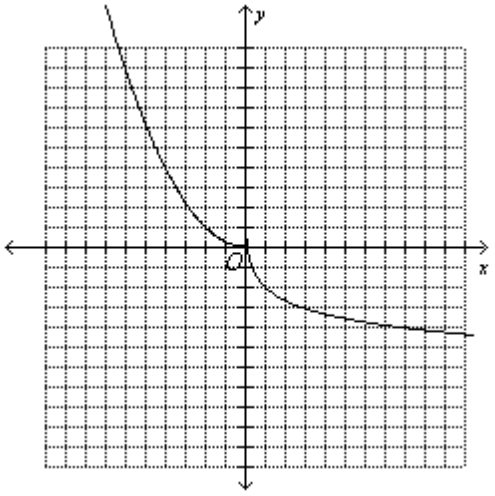
Name:_____ Class:_____ Date:_____

Precalculus-G11-Ch0_Test

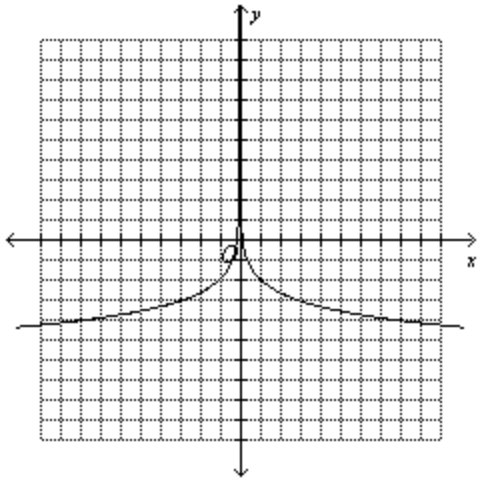
1. The graph below is a portion of a complete graph. Which graph below is the complete graph assuming it is an even function?



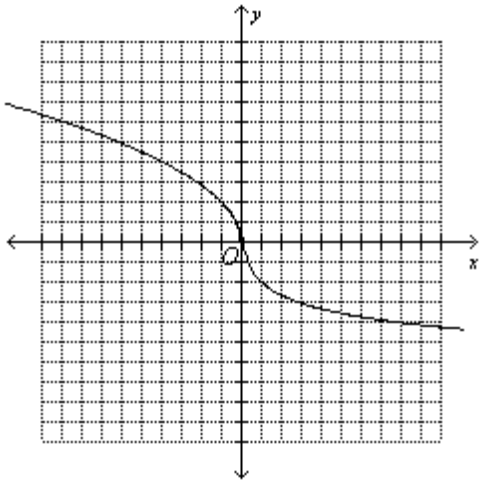
a.



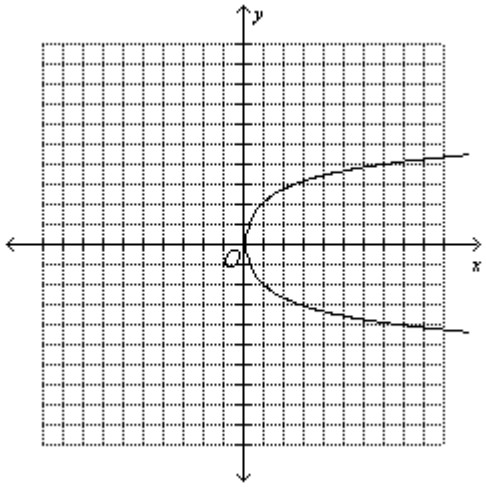
b.



c.



d.



Name:_____ Class:_____ Date:_____

Precalculus-G11-Ch0_Test

2. Choose the phrase that best describes the matrix.

$$\begin{bmatrix} 9 & 8 & -7 \\ -2 & -4 & 9 \\ -7 & 8 & -5 \end{bmatrix}$$

a. augmented matrix
b. coefficient matrix
c. augmented matrix in row-echelon form
d. none of the above

3. If $\cos x = \frac{\sqrt{3}}{2}$, find $\cos(x + \pi)$.

a. $\frac{-\sqrt{3} - 1}{2}$

b. $-\frac{\sqrt{3}}{2}$

c. $-\frac{1}{2}$

d. $\frac{\sqrt{3}}{2}$

4. The graph of the equation x = y2 + 7 is symmetric with respect to which of the following?

a. the line $y = x$
b. the line $y = -x + 7$
c. the y-axis
d. the x-axis

5. Simplify $\frac{1 - \sec^2 \theta}{\tan^2 \theta}$.

a. $\tan^2 \theta$

b. $\csc^2 \theta$

c. –1

d. 1

Name:_____ Class:_____ Date:_____

Precalculus-G11-Ch0_Test

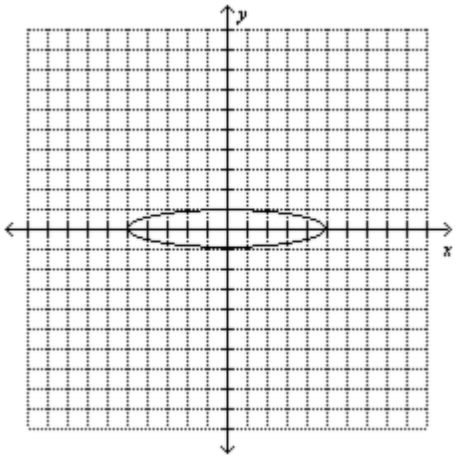
Find the maximum and minimum values of the objective function $f(x, y)$ and for what values of x and y they occur, subject to the given constraints.

6. $f(x, y) = x + 10y$
$x \geq 0$
$y \geq 0$
$3x + 6y \leq 84$
$9x + 3y \leq 72$

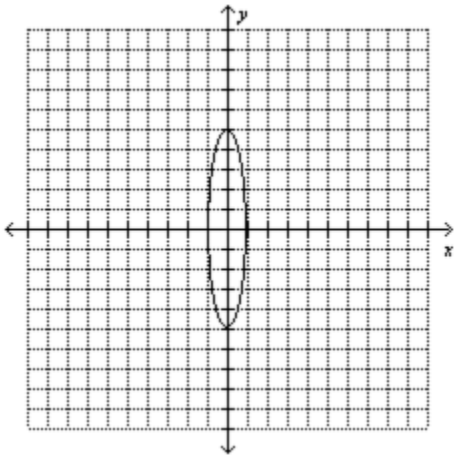
a. max at (0, 14) = 140, min at (0, 0) = 0
b. max at (5, 15) = 155, min at (0, 0) = 0
c. max at (8, 0) = 8, min at (0, 0) = 0
d. max at (4, 12) = 124, min at (0, 0) = 0

7. Which of the following is the graph of $25x^2 + y^2 = 25$?

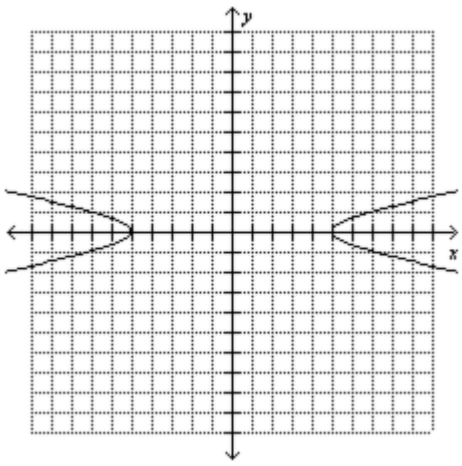
a.



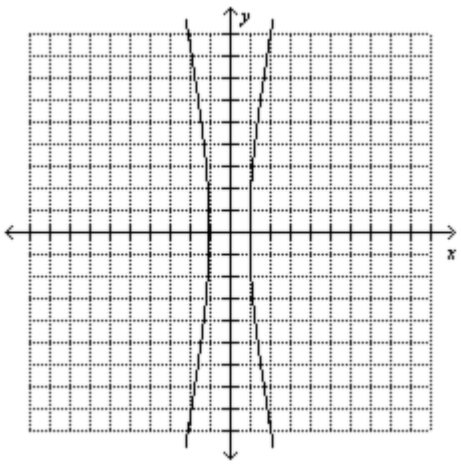
b.



c.



d.



Name:_____ Class:_____ Date:_____

Precalculus-G11-Ch0_Test

8. Use Cramer's Rule to find the solution of the system of linear equations, if a unique solution exists.

$-2x - 8y = 76$
$-7x - y = 77$

a. (–10, –7) b. (–13, –6)
c. (–10, –6) d. no unique solution

9. Use an inverse matrix to solve the system of equations, if possible.

$x - 5y + 2z = -33$
$-x - 4y + z = -42$
$x - 9y - 6z = -113$

a. $(8, -1, 5)$ b. $(7, 10, 5)$
c. $(8, 9, 2)$ d. no solution

10. Find the component form of the vector v with magnitude 3 and direction angle 41°.

a. <–2.96, –0.48> b. <1.97, 2.26>
c. <0.25, 0.22> d. <2.26, 1.97>

11. Which statement is true for the graph of $f(x) = 2x^3 - 6x^2 - 48x + 24$?

a. (4, –140) is a relative minimum; (–2, 77) is a relative maximum
b. (4, –136) is a relative minimum; (–2, 80) is a relative maximum
c. (–2, 80) is a relative minimum; (4, –136) is a relative maximum
d. (–2, 77) is a relative minimum; (4, –140) is a relative maximum

12. Which of the following statements is (are) true for all positive integers?

1) $\frac{1}{5} + \frac{1}{5^2} + \frac{1}{5^3} + \ldots + \frac{1}{5^n} = \frac{1}{3}\left(1 - \frac{1}{2^n}\right)$

2) $9^n - 1$ is divisible by 7.

a. Both statements are true. b. None of the statements are true.
c. Only the second statement is true. d. Only the first statement is true.

Name:_____ Class:_____ Date:_____

Precalculus-G11-Ch0_Test

13. If $\csc\theta = -\frac{5}{4}$ on the interval $(270°, 360°)$, find $\tan\theta$.

a. $-\frac{4}{3}$

b. $\frac{3}{4}$

c. $\frac{4}{3}$

d. $-\frac{4}{5}$

14. Choose the phrase that best describes the matrix.

$$\begin{bmatrix} -1 & -3 & -1 \\ 9 & -9 & -1 \\ -1 & -3 & 4 \end{bmatrix}$$

a. coefficient matrix
b. augmented matrix in row-echelon form
c. augmented matrix
d. none of the above

15. While moving, Jacob pushes a dolly up a ramp with a constant force of 85 N. If the ramp has an incline of 10° with the horizontal, what amount of work (in joules) will Jacob have do to push the dolly 30 meters?

a. about 443 joules
b. about 2511 joules
c. about 436 joules
d. about 2550 joules

16. Solve the system of equations using Gauss-Jordan elimination.

$-4x + 6y - 2z = -54$
$-14x + 18y - 12z = -140$
$-10x + 14y - 6z = -122$

a. $x = 4$, $y = -8$, and $z = -5$
b. $x = -9$, $y = 7$, and $z = 66$
c. $x = -7$, $y = 9$, and $z = -7$
d. no solution

17. Find the volume of the parallelepiped with adjacent edges t = 9j – 6j + 2k, u = i – j + 3k and v = –2i – 10j + 5k.

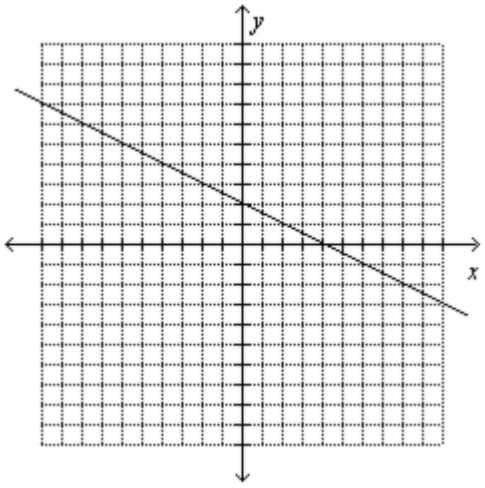
a. 209 cubic units
b. 53 cubic units
c. 11 cubic units
d. 267 cubic units

Name:_____ Class:_____ Date:_____

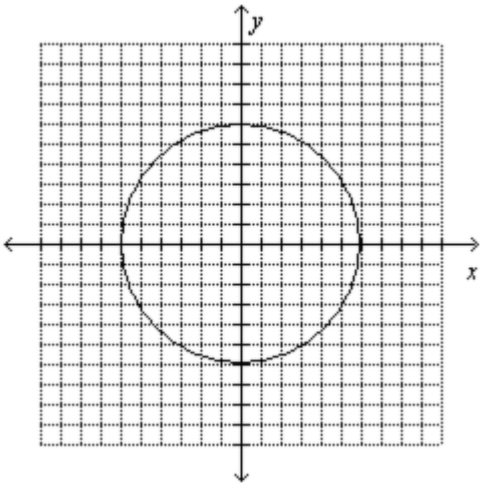
Precalculus-G11-Ch0_Test

18. Which of the following graphs is a function?

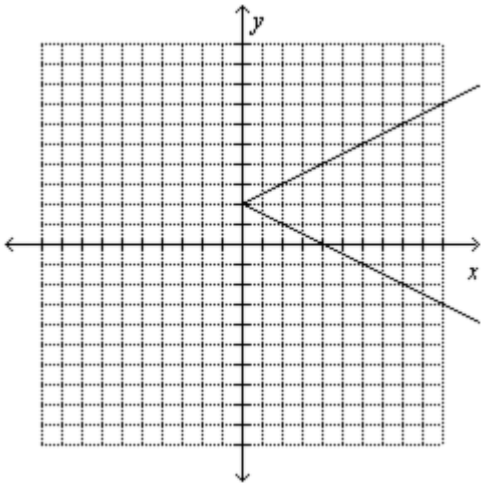
a.



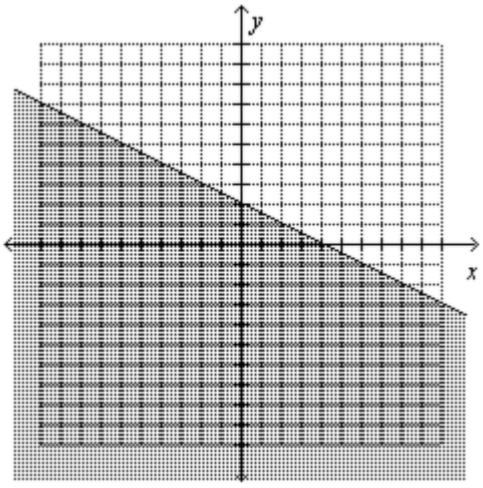
b.



c.



d.



19. Which of the following statements is (are) true for all positive integers?

1) $\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+\frac{1}{3\cdot 4}+\ldots+\frac{1}{n(n+1)}=\frac{n}{n+1}$

2) $\frac{1}{5}+\frac{1}{5^2}+\frac{1}{5^3}+\ldots+\frac{1}{5^n}=\frac{1}{4}\left(1-\frac{1}{5^n}\right)$

a. Both statements are true.
b. None of the statements are true.
c. Only the first statement is true.
d. Only the second statement is true.

Name:_____ Class:_____ Date:_____

Precalculus-G11-Ch0_Test

20. Identify the function for which an inverse function exists.

a. $f(x) = 5x^2 - 3$ b. $f(x) = |x - 1|$
c. $f(x) = \sqrt{x + 2}$ d. $f(x) = [[x + 5]]$

Find the maximum and minimum values of the objective function $f(x, y)$ and for what values of x and y they occur, subject to the given constraints.

21. $f(x, y) = 4x + 6y$
$y \leq -4x - 4$
$y \leq 2x - 10$
$y \geq -4x + 20$

a. min at $(1, -8) = -44$, max at $(5, 0) = 20$ b. min at $(1, -8) = -44$, no max
c. max at $(1, -8) = -44$, no min d. max at $(5, 0) = 20$, no min

Find the maximum and minimum values of the objective function $f(x, y)$ and for what values of x and y they occur, subject to the given constraints.

22. $f(x, y) = x + 7y$
$x \geq 0$
$y \geq 0$
$3x + 9y \leq 99$
$9x + 2y \leq 72$

a. max at (7, 12) = 91, min at (0, 0) = 0 b. max at $(8, 0) = 8$, min at $(0, 0) = 0$
c. max at $(6, 9) = 69$, min at $(0, 0) = 0$ d. max at $(0, 11) = 77$, min at $(0, 0) = 0$

23. Which of the following statements is (are) true for all positive integers?

1) $7^n - 2^n$ is divisible by 5.
2) $n^2 + 2n$ is divisible by 2.

a. Both statements are true. b. None of the statements are true.
c. Only the first statement is true. d. Only the second statement is true.

Precalculus-G11-Ch0_Test

24. Use an inverse matrix to solve the system of equations, if possible.

$-6x + 5y + 4z = 0$
$5x + 7y + 4z = -74$
$4x + 2y - 4z = -16$

a. $(-6, -4, -4)$ b. $(-6, -4, -4)$
c. $(-6, 5, -4)$ d. no solution

25. Solve the system of equations.

$-3x + 3y - 9z + 42w = -42$
$-6x + 3y - 18z + 96w = -54$
$x - y + 2z - 10w = 11$

a. $(-8 - w, -7 + 10w, -2 - 10w, w)$ b. $(4 + 4w, 4 + 4w, 3 - 2w, w)$
c. $(4, -133, 1, 9)$ d. $(-5 + 6w, -10 + 4w, 3 + 4w, w)$

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