SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the system algebraically.

1) $y = x^3 + x^2$

    $y = 4x^2$

1) _____

Solve.

2) Find the dimensions of a rectangular enclosure with perimeter 40 yd and area 91 yd^2.

2) _____

Find the matrix product, if possible.

3) $\begin{bmatrix} -1 & 3 \\ 3 & 2 \end{bmatrix}\begin{bmatrix} 0 & -2 & 4 \\ 1 & -3 & 2 \end{bmatrix}$

3) _____

4) $\begin{bmatrix} -1 & 3 \\ 1 & 6 \end{bmatrix}\begin{bmatrix} 0 & -2 & 5 \\ 1 & -3 & 2 \end{bmatrix}$

4) _____

Determine whether the matrices are inverses.

5) $\begin{bmatrix} -2 & 4 \\ 4 & -4 \end{bmatrix}, \begin{bmatrix} \dfrac{1}{2} & \dfrac{1}{4} \\ \dfrac{1}{2} & \dfrac{1}{4} \end{bmatrix}$

5) _____

Find a row echelon form or a reduced row echelon form, as indicated, for the given matrix.

6) Find a row echelon form for the matrix.   6) _____

$$\begin{bmatrix} 1 & -4 & 5 & -8 \\ -1 & 6 & 7 & 7 \\ -2 & 12 & 16 & -6 \end{bmatrix}$$

Use Gaussian elimination to solve the system of equations.

7) $x - y + 4z = -15$ 7) _____
   $5x \quad + z = -4$
   $x + 5y + z = -9$

Solve the system of equations by finding the reduced row echelon form for the augmented matrix.

8) $x + y + z = 7$ 8) _____
   $x - y + 4z = 24$
   $5x + y + z = 19$

Solve the system of equations by using an inverse matrix.

9) $-5x + 3y = 8$ 9) _____
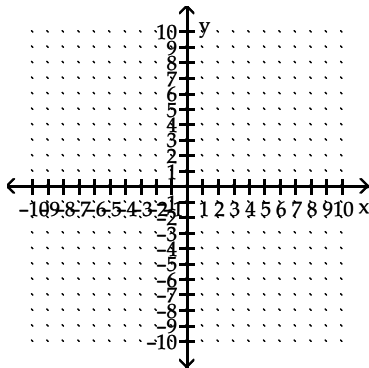 $2x - 4y = -20$

Answer the question.

10) Find a, b, and c so that the graph of the equation $y = ax^2 + bx + c$ passes
through the points (5, 97), (3, 41), and (2, 22).

10) _____

Graph the system of inequalities. Shade the region that represents the solution set.

11) $y \geq x^2$
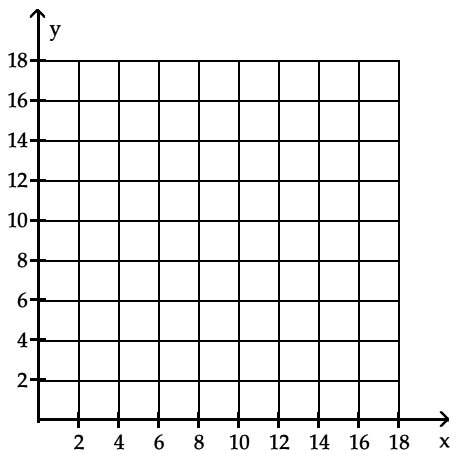
     $x + y \leq 2$

11)

Solve the problem.

12) Find the maximum value of $P = 8x + 12y$ subject to the following constraints. 12) _____

$$40x + 80y \leq 560$$
$$6x + 8y \leq 72$$
$$x \geq 0$$
$$y \geq 0$$

Sketch the graph and show the feasible set

Find the partial fraction decomposition.

13) $\dfrac{x + 2}{x^2 - 1} = \dfrac{A}{x + 1} + \dfrac{B}{x - 1}$ 13) _____

14) $\dfrac{3}{x^2 + 4x + 3} = \dfrac{A}{x + 3} + \dfrac{B}{x + 1}$ 14) _____

1) $(0, 0)$ and $(3, 36)$
2) 13 yd by 7 yd
3)
$$\begin{bmatrix} 3 & -7 & 2 \\ 2 & -12 & 16 \end{bmatrix}$$
4)
$$\begin{bmatrix} 3 & -7 & 1 \\ 6 & -20 & 17 \end{bmatrix}$$
5) No
6) Answers may vary. Possible answer:

$$\begin{bmatrix} 1 & -4 & 5 & -8 \\ 0 & 1 & 6 & -0.5 \\ 0 & 0 & 1 & -10 \end{bmatrix}$$
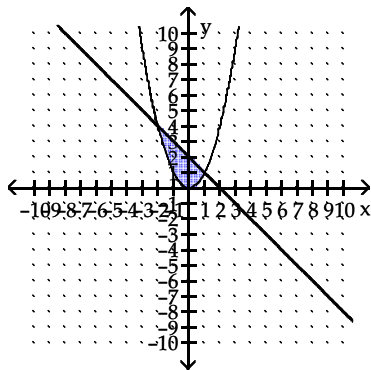7) $(0, -1, -4)$
8) $(3, -1, 5)$
9) $(2, 6)$
10) $y = 3x^2 + 4x + 2$
11)

12) Maximum of 100
13) $A = -\dfrac{1}{2}$, $B = \dfrac{3}{2}$

14) $A = -\dfrac{3}{2}$, $B = \dfrac{3}{2}$