Exam

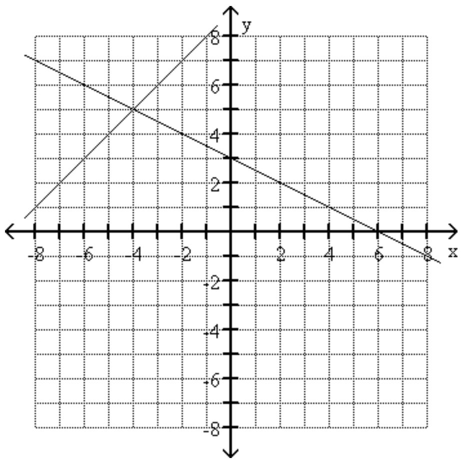
Name_________________________________

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

Solve the system by inspecting the graph of the equations.

1) $x + 2y = 6$
$3x - 3y = -27$

1) ______________



Solve the system by substitution.

2) $x + y = 3$
$x - y = -7$

2) ______________

3) $5x - 3y = 25$
$8x + 4y = 84$

3) ______________

Solve the system by addition.

4) $x + 8y = -24$
$-5x + 9y = -27$

4) ______________

5) $8x + 3y = -57$
$16x = -59 - 6y$

5) ______________

6) $\frac{1}{8}x + \frac{1}{6}y = 6$

$\frac{3}{8}x + \frac{1}{2}y = 19$

6) ______________

Solve the problem.

7) There were 31,000 people at a ball game in Los Angeles. The day's receipts were \$214,000. How many people paid \$13 for reserved seats and how many paid \$4 for general admission?

7) ______________

Determine whether the given point is in the solution set to the given system.

8) (2, 9, -4) 8) ____________

$$\begin{aligned} 2x - 5y - 9z &= -5 \\ x + y + z &= 7 \\ 3x - y + 5z &= 35 \end{aligned}$$

9) (-2, 6, -1) 9) ____________

$$\begin{aligned} -x + 3y + 4z &= 16 \\ 3x + 2y - z &= 7 \\ 4x - y + 3z &= -17 \end{aligned}$$

Solve the system of equations.

10) 10) ____________

$$\begin{aligned} x + y + z &= 8 \\ x - y + 2z &= 9 \\ 3x + y + z &= 16 \end{aligned}$$

11) 11) ____________

$$\begin{aligned} x + 2y + 5z &= 20 \\ 2y + 4z &= 22 \\ z &= 3 \end{aligned}$$

12) 12) ____________

$$\begin{aligned} 5x - 7y + 9z &= -1 \\ 7x + 5y - 3z &= -2 \\ 15x - 21y + 27z &= -3 \end{aligned}$$

13) 13) ____________

$$\begin{aligned} 3x + y &= -2 \\ 3x - z &= 6 \\ y + z &= -8 \end{aligned}$$

Use a system of equations to find the parabola of the form $y = ax^2 + bx + c$ that goes through the three given points.

14) (-4, -35), (-2, -7), (-3, -18) 14) ____________

Solve the problem.

15) A $104,000 trust is to be invested in bonds paying 6%, CDs paying 5%, and mortgages paying 8%. The bond and CD investment together must equal the mortgage investment. To earn a $7050 annual income from the investments, how much should the bank invest in bonds? 15) ____________

16) The sum of a student's three scores is 228. If the first is 11 points more than the second, and the sum of the first two is 21 more than twice the third, what was the first score? 16) ____________

17) A company makes 3 types of cable. Cable A requires 3 black, 3 white, and 2 red wires. B requires 1 black, 2 white, and 1 red. C requires 2 black, 1 white, and 2 red. They used 95 black, 100 white and 90 red wires. How many of each cable were made? 17) ____________

Solve the system.

18) $x^2 + y^2 = 25$
$x + y = -7$

18) ______________

19) $xy - x^2 = -20$
$x - 2y = 3$

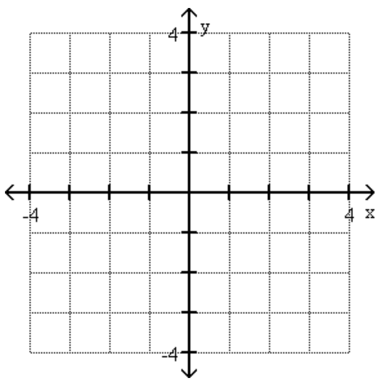
19) ______________

20) $x^2 + y^2 = 36$
$x^2 - y^2 = 36$

20) ______________

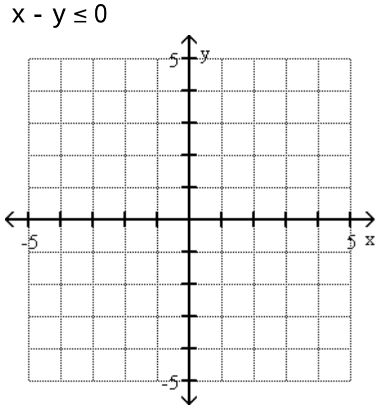
Graph the solution set of the system.

21) $2x + y \leq 4$
$x - 1 \geq 0$



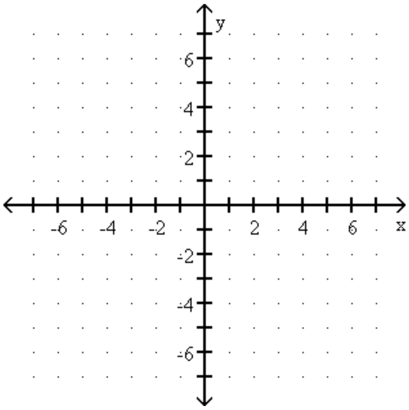
21) ______________

22) $x + 2y \geq 2$
$x - y \leq 0$



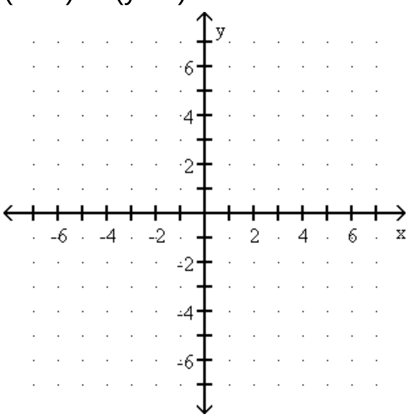
22) ______________

23) $y \le -x^2 - 6x - 4$
$y \ge x^2 + 6x + 4$



23) ______________

24) $(x + 2)^2 + (y - 4)^2 \ge 9$
$(x - 2)^2 + (y - 4)^2 \le 9$



24) ______________

Write the augmented matrix for the system.

25) $6x + 8y + 6z = 76$
$7x - 2y + 7z = 66$
$6x + 2y + 3z = 40$

25) ______________

26)
$3x \quad\quad + 5z = 8$
$\quad 9y + 5z = 71$
$2x + 2y + 7z = 16$

26) ______________

Solve the system using Gaussian elimination.

27) $6x + 3y = -9$
$5x + 6y = 3$

27) ______________

28) $\begin{aligned} 6x - 7y &= -8 \\ 12x - 14y &= 2 \end{aligned}$ 28) ______________

29) $\begin{aligned} 4x - 6y - 6z &= 6 \\ 4x + 5y - 3z &= 3 \\ 12x - 18y - 18z &= 5 \end{aligned}$ 29) ______________

Find the sum, if possible.

30) $\begin{bmatrix} -3 & -7 \\ -1 & 5 \\ -1 & 5 \end{bmatrix} + \begin{bmatrix} 9 & -8 \\ 6 & 1 \\ -9 & -7 \end{bmatrix}$ 30) ______________

Find the indicated matrix.

31) Let $C = \begin{bmatrix} 6 \\ -2 \\ 10 \end{bmatrix}$. Find $\frac{1}{2}C$. 31) ______________

Solve the system of equations corresponding to the given matrix equation.

32) $\begin{bmatrix} x + y + z \\ -x - y + z \\ 2x + y - 2z \end{bmatrix} = \begin{bmatrix} 11 \\ -17 \\ 25 \end{bmatrix}$ 32) ______________

33. $\begin{bmatrix} 6 & -7 \\ 3 & 5 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$

Finally, solve this system of nonlinear equations:

$$y = 8^x$$
$$x = \log_2(2y)$$

Do it two ways:

1. Plug $x = \log_2(2y)$ in for x in the first equation. Solve the result for y.
2. Write the 2nd equation in exponential form, and then substitute $y = 8^x$ from the first equation in for y in the 2nd equation. This was Cassie's suggestion in class.

The lesson I want you to gain from this is that there's more than one road to Rome, and some roads are easier. You should be able to pick a couple different roads, and take the smoothest one.

Can you suggest another method (or two?).