

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

Indicate the answer choice that best completes the statement or answers the question.

1. Choose the phrase that best describes the matrix.

$$\left[\begin{array}{ccc|c} 1 & 3 & -9 & 3 \\ 0 & 1 & 1 & -8 \\ 0 & 0 & 1 & 6 \end{array} \right]$$

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

2. Solve the system of equations.

$$-10x - 24y + 80z = 396$$

$$-2x - 7y + 27z = 103$$

$$21x + 72y - 276z = -1068$$

- a. $x = -6, y = 7, z = 3$ b. $x = -8, y = -1, z = -1$
c. infinite solutions d. no solution

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

3. Graph the region corresponding to the solution of the system of constraints.

$$f(x, y) = 3y + x$$

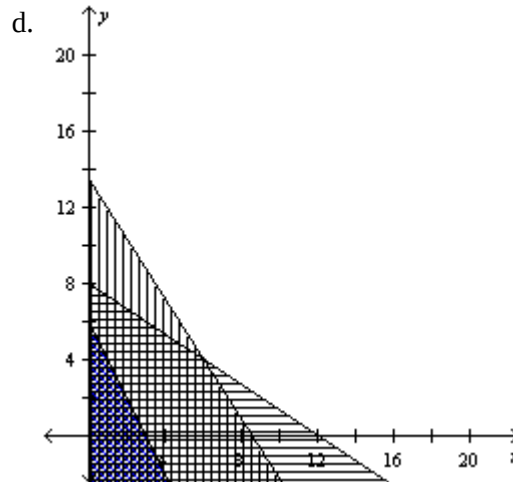
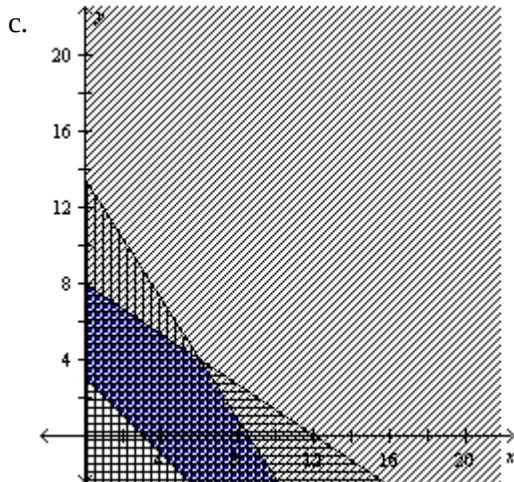
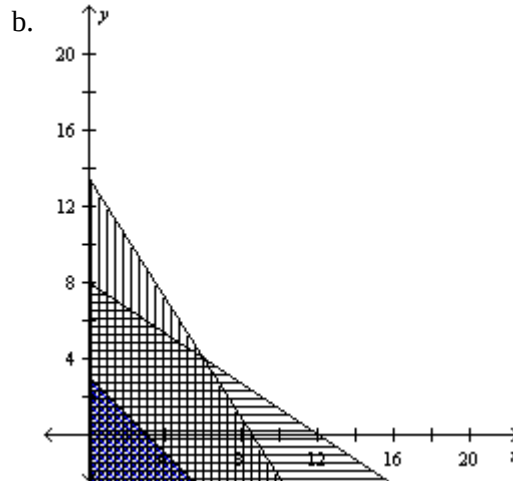
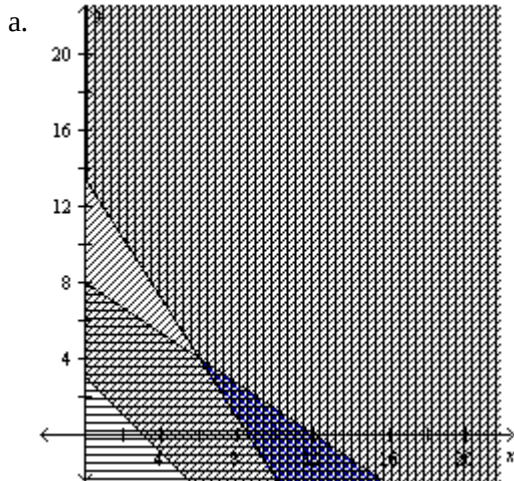
$$x \geq 0$$

$$y \geq -2$$

$$8x + 12y \leq 96$$

$$11x + 7y \leq 94$$

$$x + y \geq 3$$



4. 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

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

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

$$-4x - y + z = -31$$

$$-3x - y + 3z = -29$$

$$-x + 2y - 2z = 8$$

- a. (4, -6, 6) b. (6, 5, -2)
c. (4, -3, -2) d. no unique solution

6. Write the augmented matrix for the system of linear equations.

$$9w + 9x + 9y + 7z = -7$$

$$5x - 6y + 5z = 5$$

$$3w - 7x + 2y - 7z = 4$$

$$w - 4x + 9y = 1$$

a. $\left[\begin{array}{cccc|c} 9 & 9 & 9 & 7 & -7 \\ 0 & 5 & -6 & 5 & 5 \\ 3 & -7 & 2 & -7 & 4 \\ 1 & -4 & 9 & 0 & 1 \end{array} \right]$

b. $\left[\begin{array}{cccc|c} 3 & -7 & 2 & -7 & 4 \\ 0 & 5 & -6 & 5 & 5 \\ 9 & 9 & 9 & 7 & -7 \\ 0 & 1 & -4 & 9 & 1 \end{array} \right]$

c. $\left[\begin{array}{cccc|c} 9 & 9 & 9 & 7 & -7 \\ 5 & 5 & -6 & 5 & 5 \\ 1 & -4 & 9 & 9 & 1 \\ 3 & -7 & 2 & -7 & 4 \end{array} \right]$

d. $\left[\begin{array}{cccc|c} 3 & -7 & 2 & -7 & 4 \\ 5 & -6 & 5 & 5 & 0 \\ 9 & 9 & 9 & 7 & -7 \\ 1 & -4 & 9 & 1 & 0 \end{array} \right]$

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.

7. $f(x, y) = 2x + 6y$

$$y \leq -2x - 5$$

$$y \leq 6x - 13$$

$$y \geq -2x + 43$$

- a. min at (1, -7) = -40, b. max at (7, 29) = 188, no min
max at (7, 29) = 188
c. max at (1, -7) = -40, no min d. min at (1, -7) = -40, no max

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

8. $f(x, y) = x + 7y$

$$x \geq 0$$

$$y \geq 0$$

$$3x + 9y \leq 99$$

$$9x + 2y \leq 72$$

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 $(0, 0) = 0$

9. 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

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

$$x + 5y - 3z = -10$$

$$-5x + 6y - 5z = -21$$

$$-x + 8y - 8z = -25$$

a. $(1, -1, 2)$

b. $(-6, -5, 2)$

c. $(-6, -2, -2)$

d. no solution

Precalculus-G11-Ch.6-H.W.

11. Write the augmented matrix for the system of linear equations.

$$-9w + x + 8y + 2z = -6$$

$$-5x + 9y - 7z = 6$$

$$-3w - 6x + 4y + 9z = 4$$

$$-3w - 8x + y = -2$$

a.
$$\left[\begin{array}{cccc|c} -9 & 1 & 8 & 2 & -6 \\ 0 & -5 & 9 & -7 & 6 \\ -3 & -6 & 4 & 9 & 4 \\ -3 & -8 & 1 & 0 & -2 \end{array} \right]$$

b.
$$\left[\begin{array}{cccc|c} -3 & -6 & 4 & 9 & 4 \\ 0 & -5 & 9 & -7 & 6 \\ -9 & 1 & 8 & 2 & -6 \\ 0 & -3 & -8 & 1 & -2 \end{array} \right]$$

c.
$$\left[\begin{array}{cccc|c} -9 & 1 & 8 & 2 & -6 \\ -5 & -5 & 9 & -7 & 6 \\ -3 & -8 & 1 & 1 & -2 \\ -3 & -6 & 4 & 9 & 4 \end{array} \right]$$

d.
$$\left[\begin{array}{cccc|c} -3 & -6 & 4 & 9 & 4 \\ -5 & 9 & -7 & 6 & 0 \\ -9 & 1 & 8 & 2 & -6 \\ -3 & -8 & 1 & -2 & 0 \end{array} \right]$$

12. Choose the phrase that best describes the matrix.

$$\left[\begin{array}{ccc|c} 1 & 2 & -5 & -9 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 6 \end{array} \right]$$

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

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.

13. $f(x, y) = 3x + 3y$

$$y \leq -4x - 6$$

$$y \geq 6x - 6$$

$$y \geq -4x + 54$$

- a. min at $(0, -6) = -18$,
max at $(6, 30) = 108$
c. max at $(6, 30) = 108$, no min b. min at $(0, -6) = -18$, no max
d. max at $(0, -6) = -18$, no min

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

14. $f(x, y) = 4x + 6y$

$$y \leq -4x - 4$$

$$y \geq 2x - 10$$

$$y \geq -4x + 20$$

a. min at $(1, -8) = -44$,

b. min at $(1, -8) = -44$, no max

max at $(5, 0) = 20$

c. max at $(1, -8) = -44$, no min

d. max at $(5, 0) = 20$, no min

15. $f(x, y) = 2x + 6y$

$$x \geq 0$$

$$y \geq 0$$

$$2x + 7y \leq 70$$

$$8x + 4y \leq 136$$

a. max at $(14, 6) = 64$, min at $(0, 0) = 0$

b. max at $(15, 9) = 84$, min at $(0, 0) = 0$

c. max at $(0, 10) = 60$, min at $(0, 0) = 0$

d. max at $(17, 0) = 34$, min at $(0, 0) = 0$

16. $f(x, y) = 6x + 2y$

$$y \leq -3x - 1$$

$$y \geq 4x - 8$$

$$y \geq -3x + 20$$

a. min at $(1, -4) = -2$,

b. min at $(1, -4) = -2$, no max

max at $(4, 8) = 40$

c. max at $(1, -4) = -2$, no min

d. max at $(4, 8) = 40$, no min

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

17. Graph the region corresponding to the solution of the system of constraints.

$$f(x, y) = 3y + x$$

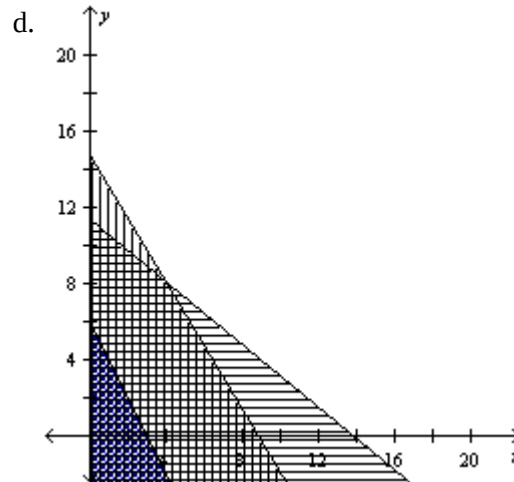
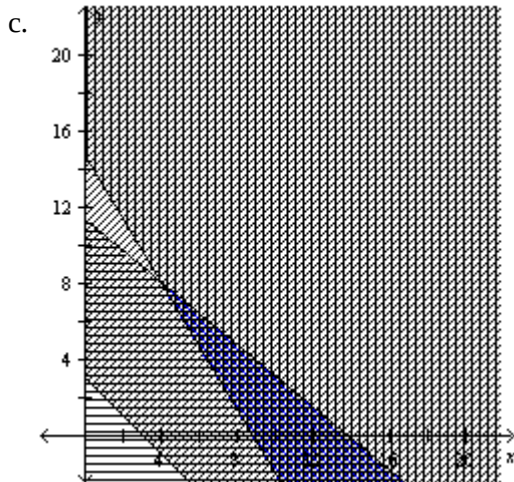
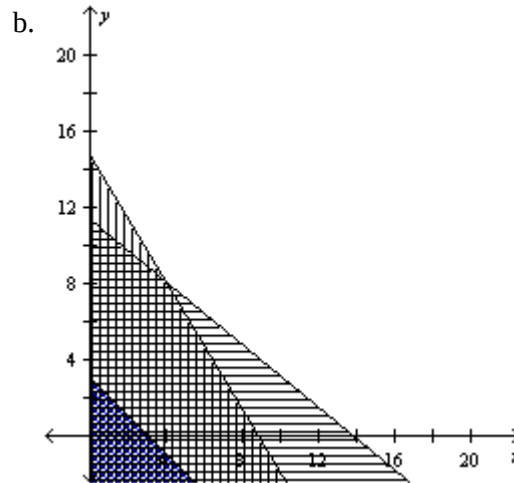
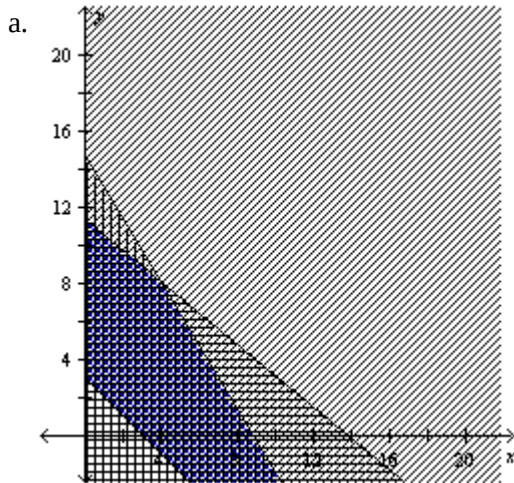
$$x \geq 0$$

$$y \geq -2$$

$$9x + 11y \leq 124$$

$$10x + 6y \leq 88$$

$$2x + 2y \geq 6$$



Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

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.

18. $f(x, y) = x + 10y$

$$x \geq 0$$

$$y \geq 0$$

$$3x + 6y \leq 84$$

$$9x + 3y \leq 72$$

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 $(0, 0) = 0$

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

19. Graph the region corresponding to the solution of the system of constraints.

$$f(x, y) = 3y + x$$

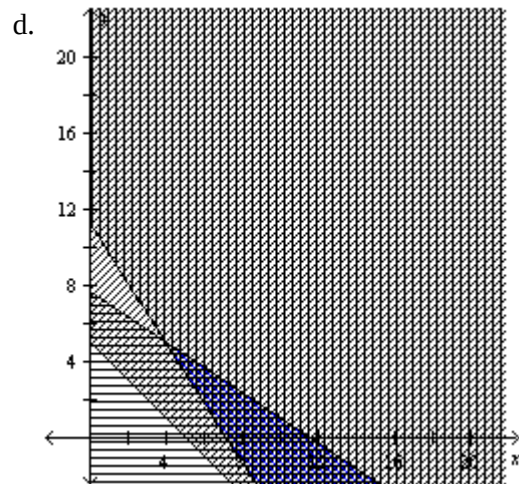
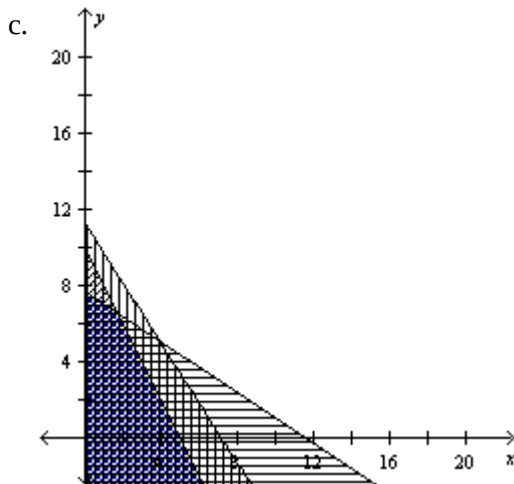
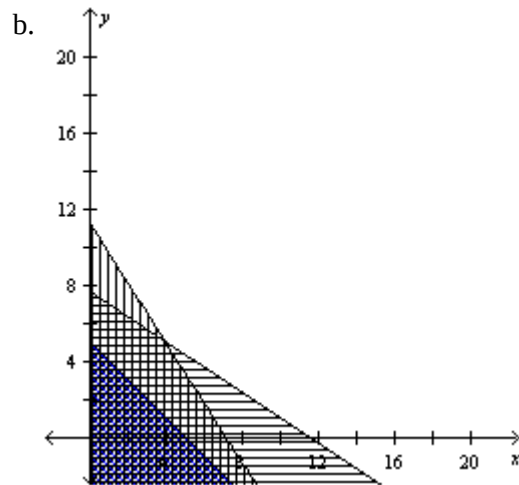
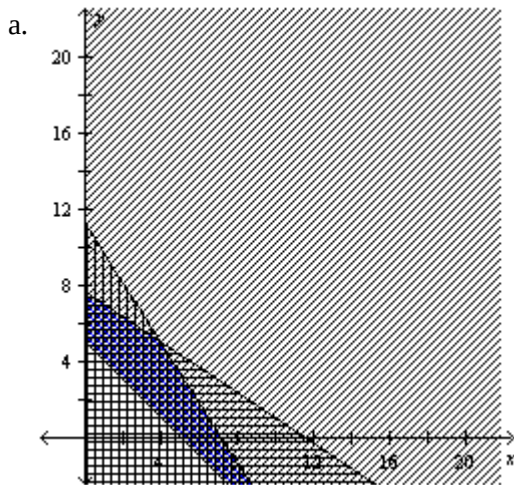
$$x \geq 0$$

$$y \geq -2$$

$$8x + 12y \leq 92$$

$$11x + 7y \leq 79$$

$$x + y \geq 5$$



Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

20. A coffee shop sells regular coffee in three sizes. The table shows the sizes of each regular coffee sold throughout the day. Write and solve a system of equations to determine the price of each regular coffee.

Time	Bajo	Mediano	Grande	Earnings (\$)
5–10	52	47	52	268.88
10–3	17	16	20	95.05
3–8	24	30	22	134.70

- a. bajo: \$1.55; mediano: \$1.78; grande: \$1.98
- b. bajo: \$1.62; mediano: \$1.84; grande: \$2.01
- c. bajo: \$1.57; mediano: \$1.76; grande: \$2.01
- d. bajo: \$1.60; mediano: \$1.75; grande: \$2.05

21. Find the inverse of $P = \begin{bmatrix} 2 & 5 \\ 3 & -4 \end{bmatrix}$, if it exists.

a. $\begin{bmatrix} \frac{4}{23} & \frac{5}{23} \\ -\frac{3}{23} & \frac{4}{23} \end{bmatrix}$

b. $\begin{bmatrix} \frac{4}{23} & \frac{5}{23} \\ \frac{3}{23} & -\frac{2}{23} \end{bmatrix}$

c. $\begin{bmatrix} -\frac{2}{23} & -\frac{5}{23} \\ \frac{3}{23} & -\frac{2}{23} \end{bmatrix}$

d. P^{-1} does not exist.

22. Find the determinant of $L = \begin{bmatrix} -4 & -5 & 3 \\ 3 & -2 & 3 \\ 1 & 1 & 2 \end{bmatrix}$.

- a. -58 b. 58
- c. 52 d. -2

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

23. Find the inverse of $R = \begin{bmatrix} 0 & 0 \\ 4 & 3 \end{bmatrix}$, if it exists.

a. $\begin{bmatrix} 0 & 0 \\ 3 & 4 \end{bmatrix}$

b. $\begin{bmatrix} 0 & 0 \\ \frac{1}{4} & \frac{1}{3} \end{bmatrix}$

c. $\begin{bmatrix} 4 & 3 \\ 0 & 0 \end{bmatrix}$

d. R^{-1} does not exist.

24. Find the inverse of $P = \begin{bmatrix} 4 & 5 \\ 1 & -5 \end{bmatrix}$, if it exists.

a. $\begin{bmatrix} \frac{1}{5} & \frac{1}{5} \\ -\frac{1}{25} & \frac{1}{5} \end{bmatrix}$

b. $\begin{bmatrix} \frac{1}{5} & \frac{1}{5} \\ \frac{1}{25} & -\frac{4}{25} \end{bmatrix}$

c. $\begin{bmatrix} -\frac{4}{25} & -\frac{1}{5} \\ \frac{1}{25} & -\frac{4}{25} \end{bmatrix}$

d. P^{-1} does not exist.

25. Solve the matrix equation by using inverse matrices.

$$\begin{bmatrix} 5 & 2 \\ -3 & 3 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 \\ 39 \end{bmatrix}$$

a. $(\frac{16}{5}, 9)$

b. $(4, -9)$

c. $(-4, 9)$

d. $(-\frac{2}{7}, 0)$

Precalculus-G11-Ch.6-H.W.

26. Solve the matrix equation by using inverse matrices.

$$\begin{bmatrix} 5 & 6 \\ -3 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 27 \\ 23 \end{bmatrix}$$

- a. $(3, -7)$ b. $(\frac{69}{5}, 7)$
 c. $(\frac{27}{11}, -23)$ d. $(-3, 7)$

27. Find the determinant of $C = \begin{bmatrix} 2 & -4 \\ -1 & -7 \end{bmatrix}$.

- a. -30 b. -15
 c. 18 d. -18

28. Find the inverse of $P = \begin{bmatrix} 2 & 4 \\ 1 & -3 \end{bmatrix}$, if it exists.

- a. $\begin{bmatrix} \frac{3}{10} & \frac{2}{5} \\ -\frac{1}{10} & \frac{3}{10} \end{bmatrix}$ b. $\begin{bmatrix} -\frac{1}{5} & -\frac{2}{5} \\ \frac{1}{10} & -\frac{1}{5} \end{bmatrix}$
 c. $\begin{bmatrix} \frac{3}{10} & \frac{2}{5} \\ \frac{1}{10} & -\frac{1}{5} \end{bmatrix}$ d. P^{-1} does not exist.

29. Find the partial fraction decomposition of the improper rational expression $\frac{6x^2 + 12x - 177}{x^2 + x - 30}$.

- a. $6 + \frac{3}{x+6} + \frac{3}{x-5}$ b. $6x + \frac{3}{x+6} + \frac{3}{x-5}$
 c. $\frac{6}{x} + \frac{3}{x+6} + \frac{3}{x-5}$ d. $6 + \frac{3}{x+6} + \frac{3}{x-5}$

Name: _____ Class: _____ Date: _____

Precalculus-G11-Ch.6-H.W.

30. Find the partial decomposition of $\frac{-24x + 19}{-5x^2 - 17x + 12}$.

a. $\frac{1}{-5x+3} + \frac{5}{x+4}$

b. $\frac{5}{-5x+3} + \frac{1}{x+4}$

c. $\frac{1}{-5x+4} + \frac{5}{x+3}$

d. $\frac{1}{-5x+3} - \frac{5}{x+4}$

=====