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1. (1 point) Solve the following system of equations.

$$\begin{aligned} x+3y &= 17 \\ 5x &= 25 \end{aligned}$$

Write your answer in point notation: e.g., for $x=4, y=-3$ write $(4,-3)$.

Answer: _____

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2. (1 point) Solve the following system of equations. Your answer must be a point. If there is no solution, type *None* and if there are infinitely many solutions, type x for x, and an expression in terms of x for the y-coordinate.

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

Answer: _____

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3. (1 point)

Solve the system of equations by graphing. Choose the graph that represents the two given line equations, and then enter the solution.

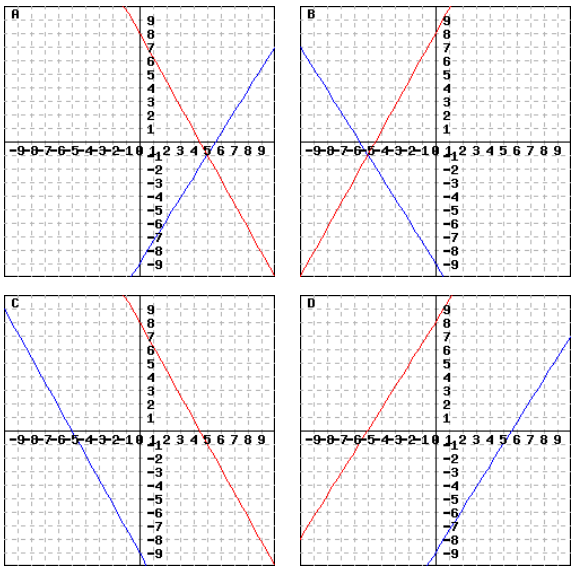
$$\begin{cases} y = -\frac{9}{5}x+8 \\ 9x+5y = -45 \end{cases}$$

The correct graph is graph

- A
- B
- C
- D

The solution of this system, written as an ordered pair, is _____.

(If these two lines don't intersect, type **no solution**.
If these two lines overlap each other, type **infinitely many solutions**.)



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4. (1 point) For each system, determine whether it has a unique solution (in this case, find the solution), infinitely many solutions, or no solutions.

(1) $\begin{cases} -7x-4y=0 \\ 8x-9y=0 \end{cases}$

- A. Unique solution: $x=9,\ y=-7$
- B. Infinitely many solutions
- C. No solutions
- D. Unique solution: $x=-11,\ y=-1$
- E. Unique solution: $x=0,\ y=0$
- F. None of the above

(2) $\begin{cases} 3x+4y=-2 \\ -5x+9y=-28 \end{cases}$

- A. Unique solution: $x=0,\ y=0$
- B. No solutions
- C. Infinitely many solutions
- D. Unique solution: $x=-2,\ y=2$
- E. Unique solution: $x=2,\ y=-2$
- F. None of the above

(3) $\begin{cases} 4x+6y=38 \\ -12x-18y=-113 \end{cases}$

- A. No solutions
- B. Unique solution: $x=0,\ y=0$
- C. Infinitely many solutions
- D. Unique solution: $x=38,\ y=-113$
- E. Unique solution: $x=-113,\ y=38$

- F. None of the above

(4) $\begin{cases} -2x+5y=14 \\ 6x-15y=-42 \end{cases}$

- A. Unique solution: $x=0,\ y=0$
- B. Infinitely many solutions
- C. Unique solution: $x=-7,\ y=0$
- D. Unique solution: $x=14,\ y=-42$
- E. No solutions
- F. None of the above

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5. (1 point) Solve the system using row operations (or elementary matrices).

$$\begin{cases} -6x+5y+5z=-8 \\ -3x-4y+6z=2 \\ -5x-5y+6z=8 \end{cases}$$

$x=$ _____
$y=$ _____
$z=$ _____

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6. (1 point) Determine all values of h and k for which the system

$$\begin{cases} 9x-9y=h \\ 6x+ky=-10 \end{cases}$$

has no solution.
$k=$ ____
$h\neq$ ____

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7. (1 point) Determine if the following statement is true or false:

If a linear system has four equations and seven variables, then it must have infinitely many solutions.

If the answer is true, then type **true**. If the answer is false, type **false**.

Answer: ___

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8. (1 point) Let $A=\begin{bmatrix} 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 3 & 0 & -3 \\ 0 & 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

Is the matrix in echelon form? (input Yes or No) _____
Is the matrix in reduced echelon form? (input Yes or No) _____
If this matrix were the augmented matrix for a system of linear equations, would the system be consistent or inconsistent? _____

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9. (1 point) Determine whether the following matrices are in echelon form, reduced echelon form or not in echelon form.

- Choose
- Echelon Form
- Reduced Echelon Form
- Not in Echelon Form

(1) $\begin{bmatrix} 1 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & -8 \\ 0 & 0 & 1 & 0 \end{bmatrix}$

- Choose
- Echelon Form
- Reduced Echelon Form
- Not in Echelon Form

(2) $\begin{bmatrix} 0 & 1 & 0 & 9 \\ 0 & 0 & 1 & -10 \end{bmatrix}$

- Choose
- Echelon Form
- Reduced Echelon Form
- Not in Echelon Form

(3) $\begin{bmatrix} 1 & 0 & 0 & -7 \\ 0 & 1 & 0 & -4 \\ 0 & 0 & 1 & -2 \end{bmatrix}$

- Choose
- Echelon Form
- Reduced Echelon Form
- Not in Echelon Form

(4) $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & -8 \end{bmatrix}$

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10. (1 point) Reduce the matrix

$$A=\begin{bmatrix} 3 & -1 & 4 & -4 \\ 3 & 0 & -3 & -21 \\ -2 & 3 & -2 & 14 \end{bmatrix}$$

to reduced row-echelon form.

$$\begin{bmatrix} \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \end{bmatrix}$$

11. (1 point) Solve the system

$$\begin{cases} x_1 + 4x_3 + 4x_4 = -20 \\ x_2 - 3x_3 - 2x_4 = 7 \\ 3x_1 - 3x_2 + 23x_3 + 18x_4 = -85 \\ -x_2 + 3x_3 + 6x_4 = -15 \end{cases}$$

$x_1 =$ _____
$x_2 =$ _____
$x_3 =$ _____
$x_4 =$ _____

12. (1 point) If the linear system

$$\begin{array}{rcrcrcr} -4x & - & 6y & + & 7z & = & 3 \\ -6x & - & 3y & + & 3z & = & -2 \\ 24x & + & 24y & + & hz & = & k \end{array}$$

has infinitely many solutions, then $k =$ ___ and $h =$ ___.

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