

Name (print) Key

Show your work on all problems, and leave your solutions in the simplest form possible.

1. Solve, using the elimination method

$$\begin{cases} 2x+4y=-6 & \leftarrow \text{multiply by 2} \\ 3x-2y=-1 & \leftarrow \quad \quad \quad \cdot 4 \end{cases}$$

$$\begin{cases} 4x+8y=-12 \\ 12x-8y=-4 \end{cases}$$

$$16x = -16 \Rightarrow \boxed{x = -1}$$

$$\begin{aligned} 2(-1) + 4y &= -6 \\ -2 + 4y &= -6 \\ 4y &= -4 \end{aligned}$$

$$\boxed{y = -1}$$

Solve, using the substitution method

$$\begin{cases} 2x+4y=-6 & \textcircled{I} \\ 3x-2y=-1 & \textcircled{II} \end{cases}$$

$$\textcircled{II} \Rightarrow 2y = 3x + 1 \Rightarrow y = \frac{3}{2}x + \frac{1}{2}$$

$$\textcircled{I} \Rightarrow 2x + 4\left(\frac{3}{2}x + \frac{1}{2}\right) = -6$$

$$2x + 6x + 2 = -6$$

$$8x = -8$$

$$\boxed{x = -1}$$

$$2(-1) + 4y = -6$$

$$-2 + 4y = -6$$

$$+2$$

$$4y = -4 \Rightarrow \boxed{y = -1}$$

Perform the following operations

$$3. (2x^2y - 3xy + z - 2) - (3x^2y - z + 4xy) = \boxed{-x^2y - 7xy + 2z - 2}$$

$$4. (3x+2xz)(4z+3xy+xzy)$$

	4z	3xy	xzy
3x	12xz	9x ² y	3x ² zy
2xz	8xz ²	6x ² yz	2x ² z ² y

$$= \boxed{2x^2z^2y + 9x^2zy + 9x^2y + 8xz^2 + 12xz}$$

Factor the following polynomials

$$5. 4x^2y + 2xy - 3xz = x(4xy + 2y - 3z)$$

$$6. x^2 - 3x - 108$$

$$x = \frac{-(-3) \pm \sqrt{9 - 4(1)(-108)}}{2} = \frac{3 \pm 21}{2} = \begin{cases} 12 \\ -9 \end{cases}$$

$$(x-12)(x+9)$$

$$7. 6x^2 + 5x - 6$$

$$x = \frac{-5 \pm \sqrt{25 - 4(6)(-6)}}{12} = \frac{-5 \pm 13}{12} \begin{cases} \frac{2}{3} \\ -\frac{3}{2} \end{cases}$$

$$(2x + 3)(3x - 2)$$

$$8. 2x^3 - 12x^2 + 18x = 2x(x^2 - 6x + 9)$$
$$= 2x(x - 3)(x - 3)$$