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100

Outstanding!
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No books and no notes. Be sure to set up each problem before evaluation. Show all work in the space provided for full credit.

1. Solve the following system of linear equations by elimination and give the solution set. Is the system consistent or inconsistent? Are the equations independent or dependent? (16 points)

① $(4x - y = 5) \cdot 3 \Rightarrow 12x - 3y = 15$ ①

② $-5x + 3y = -1 \Rightarrow -3x + 3y = -1$ ②

$1+2 \quad 7x = 14 \Rightarrow \boxed{x = 2}$ ✓

Put $x = 2$ in equ. ①

$4(2) - y = 5$

$8 - y = 5$

$8 - 5 = y$

$\boxed{y = 3}$ ✓

→ Sol. set: $\{(x, y) | (2, 3)\}$ ✓

→ System is consistent ✓

→ Equations are Independent ✓

2. Solve the following system of linear equations and give the solution set. Are the equations independent or dependent? (14 points)

① $(-2x + 3y = 4) \cdot 4 \Rightarrow -8x + 12y = 16$ ①

② $8x - 12y = -16$ ②

$1+2 \Rightarrow 0 = 0$ True. ✓

Sol. set: $\{(x, y) | -2x + 3y = 4\}$ many many solutions.

System is consistent ✓

Equations are dependent ✓

3. Graph the compound inequality. Label the points, lines and inequalities involved.

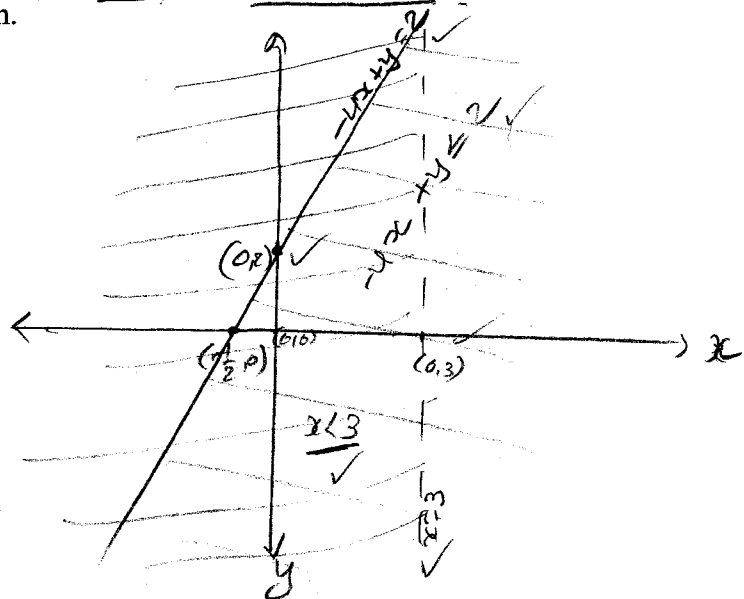
Be sure to shade the compound inequality region.

$-4x + y \leq 2$ or $x < 3$ (12 points)

Let $-4x + y = 2$ or $x = 3$

x	y
0	2
-1/2	0

- Every where shaded ✓



Factor each polynomial.

4. a) $125x^3 - 27y^3$ (8 points)

$$= (5x)^3 - (3y)^3$$
$$= (5x - 3y)(25x^2 + 15xy + 9y^2)$$

b) $4m^2 - 9$ (6 points)

$$= (2m)^2 - (3)^2$$
$$= (2m - 3)(2m + 3)$$

5. a) $3k^2 + 8k + 5$ (6 points)

$$= (3k + 5)(k + 1)$$

Diagram showing the factoring process: $3k$ is written below $(3k + 5)$, and $5k$ is written below $(k + 1)$. A bracket connects $3k$ and $5k$ to $5k$ in the second factor.

b) $4a^2 - 4a + 1$ (6 points)

$$= (2a - 1)(2a - 1)$$

Diagram showing the factoring process: $2a$ is written below $(2a - 1)$ in both factors. A bracket connects the two $2a$ terms to $2a$ in the second factor.

$$= (2a - 1)^2$$

6. $12p + 4q + 3pq^2 + q^3$ (10 points)

$$4(3p + q) + q^2(3p + q)$$
$$(3p + q)(4 + q^2)$$

7. Solve the following equation and give the solution set: (12 points)

$$3x^3 - 9x^2 + 6x = 0$$

$$3x(x^2 - 3x + 2) = 0$$

$$3x(x - 1)(x - 2)$$

$$3x = 0 \quad x - 1 = 0 \quad x - 2 = 0$$

$$x = 0 \quad x = 1 \quad x = 2$$

$$\text{Sol. set } \{0, 1, 2\}$$

8. Evaluate the following:

a) $(2x - 5)(x + 4)$ (6 points)

$$= 2x^2 - 5x + 8x - 20$$

$$= 2x^2 + 3x - 20$$

b) $(3x - 7)^2$ (6 points)

$$= 9x^2 - 42x + 49$$

[-0