Bellwork Alg 2A Wednesday, December 14, 2016

Solve each system of equations. State solutions as ordered triples.

1.

$3x + 2y + 4z = 11$
$2x - y + 3z = 4$
$5x - 3y + 5z = -1$

2.

$3x - 4y + 2z = -9$
$-4x + 4y + 10z = 32$
$-x + 2y - 7z = -7$

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Solve each system of equations. State solutions as ordered triples.

1.

① $3x + 2y + 4z = 11$
② $2x - y + 3z = 4$
③ $5x - 3y + 5z = -1$

$(-3, 2, 4)$

**using substitution:**

solve eq ② for $y$

$y = 2x + 3z - 4$

substitute this into EQ ①:

$3x + 2(2x + 3z - 4) + 4z = 11$

$3x + 4x + 6z - 8 + 4z = 11$

(A) $7x + 10z = 19$

SUBSTITUTE THIS into EQ ③:

$5x - 3(2x + 3z - 4) + 5z = -1$

$5x - 6x - 9z + 12 + 5z = -1$

(B) $-x - 4z = -13$

SOLVE SYSTEM OF EQ's USING (A) & (B)

$\begin{cases} 7x + 10z = 19 \\ 7(-x - 4z = -13) \end{cases}$

$7x + 10z = 19$

$+ \quad -7x - 28z = -91$

$-18z = -72$

$z = 4$

Find $x$ using EQ A:

$7x + 10(4) = 19$

$7x + 40 = 19$

$7x = -21$

$x = -3$

Find $y$ using EQ 1:

$3(-3) + 2y + 4(4) = 11$

$-9 + 2y + 16 = 11$

$2y + 7 = 11 \rightarrow 2y = 4 \rightarrow y = 2$

2.

① $3x - 4y + 2z = -9$
② $-4x + 4y + 10z = 32$
③ $-x + 2y - 7z = -7$

**USING ELIMINATION**

ELIMINATE $y$ using EQ's ① & ②

$3x - 4y + 2z = -9$

$+ \quad -4x + 4y + 10z = 32$

(A) $-x + 12z = 23$

ELIMINATE $y$ using EQ's ① & ③

$\begin{cases} 3x - 4y + 2z = -9 \\ 2(-x + 2y - 7z = -7) \end{cases}$

$3x - 4y + 2z = -9$

$+ \quad -2x + 4y - 14z = -14$

(B) $x - 12z = -23$

Solve the system of EQ's using A & B

$-x + 12z = 23$

$+ \quad x - 12z = -23$

$0 = 0$

THIS IS TRUE

Therefore there is:

**MANY SOLUTIONS**