10.2 #21: Find the point of intersection

$$x + y + z = 4$$
$$x + 3y + 3z = 10$$
$$2x + y - z = 3$$

STEP 1:
Eliminate z by adding the 1st and 3rd equations

STEP 2:
Eliminate z again using a different pair of equations (1st and 2nd or 2nd and 3rd)

STEP 3:
Solve system of two equations that you just created and go from there.

See next slide for more help ↓

10.2 #21: Find the point of intersection

$x + y + z = 4$ (1st)

$x + 3y + 3z = 10$

$2x + y - z = 3$ (3rd)

STEP 1:
Eliminate z by adding the 1st and 3rd equations

$$\begin{array}{r} x+y+\overset{0}{\cancel{z}}=4 \\ +\ 2x+y-\cancel{z}=3 \\ \hline 3x+2y=7 \end{array}$$

See next slide for more help ↓

10.2 #21: Find the point of intersection

$x + y + z = 4$

$x + 3y + 3z = 10$ (2nd)

$2x + y - z = 3$ (3rd)

$x + y + z = 4$

$+\ 2x + y - z = 3$

$3x + 2y = 7$

multiply by 3

$x + 3y + 3z = 10$

$6x + 3y - 3z = 9$ add

$7x + 6y = 19$

STEP 2:
Eliminate z again using a different pair of equations
(1st and 2nd or 2nd and 3rd)

Step 3

now solve these two equations together

See next slide for more help

10.2 #21: Find the point of intersection

$x + y + z = 4$

$x + 3y + 3z = 10$ (2nd)

$2x + y - z = 3$ (3rd)

multiply by 3

$$\begin{array}{r} x+y+z=4 \\ +\ 2x+y-z=3 \\ \hline 3x+2y=7 \end{array}$$

$$\begin{array}{r} x+3y+3z=10 \\ 6x+3y-3z=9 \\ \hline 7x+6y=19 \end{array}$$

add

$$-3(3x+2y=7)$$

$$7x+6y=19$$

STEP 3:
Solve system of two equations that you just created

- multiply by -3 to eliminate y
- solve for x, then find y + z using back substitution

10.2 #21: Find the point of intersection

$x + y + z = 4$

$x + 3y + 3z = 10$

$2x + y - z = 3$

STEP 3:
Solve system of two equations that you just created and go from there.