Question

Solve: $x + 3y = 15$, $x - 3y = 10$

Answer

$$\begin{array}{l} x + \cancel{3y} = 15 \\ x - \cancel{3y} = 10 \\ \hline 2x \quad = 25 \end{array}$$

Adding equations

$$x = \frac{25}{2}$$

$$x + 3y = 15$$

$$\frac{25}{2} + 3y = 15$$

$$3y = 15 - \frac{25}{2}$$

$$3y = \frac{30 - 25}{2}$$

$$3y = \frac{5}{2}$$

$$y = \frac{5}{6}$$

$$\boxed{x = \frac{25}{2} \; ; \; y = \frac{5}{6}}$$

Problem 2 of 6

Question

Solve $5x + 7y = 45$, $5x + 8y = 16$

Answer

$$\begin{array}{r} \cancel{5}x + 7y = 46 \\ \cancel{5}x + 8y = 16 \\ \hline -y = 29 \end{array}$$

Subtracting equations

$y = -29$

$5x + 7y = 45$

$5x + 7(-29) = 45$

$5x - 203 = 45$

$5x = 45 + 203$

$5x = 248$

$x = \frac{248}{5}$

$\boxed{y = -29;\ x = \frac{248}{5}}$

Problem 3 of 6

Question

Solve $3x - 4y = 24$, $5x + 4y = 50$

Answer

$$\begin{array}{r} 3x - \cancel{4y} = 24 \\ 5x + \cancel{4y} = 50 \\ \hline 8x \qquad = 74 \end{array}$$

Adding equations

$$x = \frac{37}{4}$$

$$3x - 4y = 24$$

$$3\left(\frac{37}{4}\right) - 4y = 24$$

$$\frac{111}{4} - 4y = 24$$

$$-4y = 24 - \frac{111}{4}$$

$$-4y = \frac{96 - 111}{4}$$

$$-4y = \frac{-15}{4}$$

$$y = \frac{-15}{-16}$$

$$\boxed{x = \frac{37}{4}\ ;\quad y = \frac{15}{16}}$$

Question

Solve: $2x - y = 10$, $-2x + 3y = 12$

Answer

$$\begin{array}{r} 2\cancel{x} - y = 10 \\ -2\cancel{x} + 3y = 12 \\ \hline 2y = 22 \end{array}$$

Adding equations

$y = 11$

$2x - y = 10$

$2x - 11 = 10$

$2x = 10 + 11$

$2x = 21$

$x = \frac{21}{2}$

$\boxed{x = \frac{21}{2};\ y = 11}$

Problem 5 of 6

Question

Solve $-5x + 2y = 30$, $-7x + 2y = 90$

Answer

$$\begin{array}{rl} -5x + \cancel{2y} = 30 & \text{Subtracting equations} \\ \underline{-7x + \cancel{2y} = 90} & \\ 2x \qquad = -60 & \end{array}$$

$x = -30$

$-5x + 2y = 30$

$-5(-30) + 2y = 30$

$150 + 2y = 30$

$2y = 30 - 150$

$2y = -120$

$y = -60$

$\boxed{x = -30;\ y = -60}$

Question

Solve $5x - 3y = 15$, $5y - 5x = 5$

Answer

$$\begin{array}{r} \cancel{5x} - 3y = 15 \\ -\cancel{5x} + 5y = 5 \\ \hline 2y = 20 \end{array}$$

Adding equations

$y = 10$

$5x - 3y = 15$

$5x - 3(10) = 15$

$5x - 30 = 15$

$5x = 15 + 30$

$5x = 45$

$x = 9$

$\boxed{x = 9;\ y = 10}$