

4.6 – System of Equations

Solve the following Systems of Equations using the Substitution Method

Example

$$\begin{aligned}
 y &= 2x \\
 x + 3y &= 14 \\
 x + 3(2x) &= 14 \\
 x + 6x &= 14 \\
 7x &= 14 \\
 x &= 2 \\
 y &= 2x \\
 y &= 2(2) \\
 y &= 4 \\
 &(2, 4)
 \end{aligned}$$

Check:

$$\begin{aligned}
 x + 3y &= 14 \\
 2 + 3(4) &= 14 \\
 2 + 12 &= 14 \\
 14 &= 14
 \end{aligned}$$

2) $x = y - 3$
 $5x + 3y = 1$

3) $y = -4x$
 $6x + y = 6$

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

Solve the following Systems of Equations using the Addition/Subtraction (with Multiplication) Method

Example

$$\begin{aligned}
 3b + f &= 29 \\
 b + f &= 17 \\
 \hline
 2b + 0 &= 12 \\
 2b &= 12 \\
 b &= 6
 \end{aligned}$$

We can check our solution by substituting 6 for b and 11 for f in the other equation.

Now substitute 6 for b in either equation.

Check:

$$\begin{aligned}
 3 \cdot 6 + 11 &= 29 \\
 18 + 11 &= 29 \\
 29 &= 29
 \end{aligned}$$

$6 + f = 17$
 $f = 11$

The solution is (6, 11).

5) $5x + y = 23$
 $2x + y = 14$

6) $5x - 3y = 32$
 $2x - 3y = 11$

7) $x + 2y = 2$
 $4x - 2y = 38$

8) $4x - 3y = 8$
 $4x + 3y = 32$

9) $2x + 3y = 10$
 $3x - 4y = -2$

10) $9x - 2y = 15$
 $4x + 3y = -5$

Trace the diagram below. Calculate each lettered angle measure.

