Add or Subtract to Cancel

SY05-V1 · storyboard · SY05 Eliminate by adding or subtracting. Read each picture with its sentences.

Picture 1

Solve the system $x + y = 10$, $x - y = 4$.

$2x = 14$ add: y and $-y$ cancel

$\boxed{x = 7}$

$\boxed{7 + y = 10, \quad y = 3}$ put it back

1. Solve the system x + y = 10 and x – y = 4.
2. Add the equations.
3. y and –y cancel: 2x = 14.
4. So x = 7.
5. Put it back into the first equation: 7 + y = 10, so y = 3.
6. The solution is seven, three.

Picture 2

Solve the system $3x + 2y = 16,\ x + 2y = 8.$

$$(3x + 2y) - (x + 2y) = 16 - 8$$ both have $2y$: subtract

$$2x = 8$$

$$\boxed{x = 4,\ \ y = 2}$$

7. Now 3x + 2y = 16 and x + 2y = 8.
8. Both have 2y, so subtract the whole second equation, right side too.
9. That leaves 2x = 8.
10. So x = 4, and from 4 + 2y = 8, y = 2.

Picture 3

Trap $2y$ and $2y$

$\times$ add: $4y$

✓ subtract: 0

11. Watch for the trap: adding when they are equal.
12. Equal coefficients cancel only when you subtract.

Picture 4

Trap $(3x + 2y) - (x + 2y)$

$\times \; 2x + 4y$

$\checkmark \; 2x$

13. And watch for taking away only the first term.
14. Taking away the second equation changes the sign of every term in it.