

Multi-step equations

Solve for the letter in each equation. Show your working, and write the answer on the line.

Name _____ Date _____

1. $-19 + 2p - 5p = -16$

2. $-5(x + 1) + 3x = -23$

p = _____

x = _____

3. $6n - 5 = -n + 9$

4. $-6p + 5p + 3 = 10$

n = _____

p = _____

5. $-5(t + 3) + 6t = -10$

6. $-7p - 18 = 3p - 108$

t = _____

p = _____

7. $-6k - 4k + 6 = -4$

8. $5(n - 1) + 3n = 51$

k = _____

n = _____

9. $-6x + 18 = 4x + 98$

10. $8p - 5p + 7 = 19$

x = _____

p = _____

Multi-step equations: answer key

Each equation worked one step a line. What was done to both sides is beside each step.

1. $-19 + 2p - 5p = -16$

$-3p - 19 = -16$ Combine like terms.

$-3p = 3$ Add 19 to both sides.

$p = -1$ Divide both sides by -3 .

Check: $-19 + 2(-1) - 5(-1) = -16$

2. $-5(x + 1) + 3x = -23$

$-5x - 5 + 3x = -23$ Multiply out the parentheses.

$-2x - 5 = -23$ Combine like terms.

$-2x = -18$ Add 5 to both sides.

$x = 9$ Divide both sides by -2 .

Check: $-5(9 + 1) + 3(9) = -23$

3. $6n - 5 = -n + 9$

$7n - 5 = 9$ Add n to both sides.

$7n = 14$ Add 5 to both sides.

$n = 2$ Divide both sides by 7.

Check: $6(2) - 5 = 7$ and $-2 + 9 = 7$

4. $-6p + 5p + 3 = 10$

$-p + 3 = 10$ Combine like terms.

$-p = 7$ Subtract 3 from both sides.

$p = -7$ Divide both sides by -1 .

Check: $-6(-7) + 5(-7) + 3 = 10$

5. $-5(t + 3) + 6t = -10$

$-5t - 15 + 6t = -10$ Multiply out the parentheses.

$t - 15 = -10$ Combine like terms.

$t = 5$ Add 15 to both sides.

Check: $-5(5 + 3) + 6(5) = -10$

6. $-7p - 18 = 3p - 108$

$-18 = 10p - 108$ Add $7p$ to both sides.

$90 = 10p$ Add 108 to both sides.

$9 = p$ Divide both sides by 10.

$p = 9$

Check: $-7(9) - 18 = -81$ and $3(9) - 108 = -81$

7. $-6k - 4k + 6 = -4$

$-10k + 6 = -4$ Combine like terms.

$-10k = -10$ Subtract 6 from both sides.

$k = 1$ Divide both sides by -10 .

Check: $-6(1) - 4(1) + 6 = -4$

8. $5(n - 1) + 3n = 51$

$5n - 5 + 3n = 51$ Multiply out the parentheses.

$8n - 5 = 51$ Combine like terms.

$8n = 56$ Add 5 to both sides.

$n = 7$ Divide both sides by 8.

Check: $5(7 - 1) + 3(7) = 51$

9. $-6x + 18 = 4x + 98$

$18 = 10x + 98$ Add $6x$ to both sides.

$-80 = 10x$ Subtract 98 from both sides.

$-8 = x$ Divide both sides by 10.

$x = -8$

Check: $-6(-8) + 18 = 66$ and $4(-8) + 98 = 66$

10. $8p - 5p + 7 = 19$

$3p + 7 = 19$ Combine like terms.

$3p = 12$ Subtract 7 from both sides.

$p = 4$ Divide both sides by 3.

Check: $8(4) - 5(4) + 7 = 19$