

Linear Equations

Strategy

Transform equations into $ax + b = c$ format, then use the Order of Operations in reverse using the opposite operation to isolate the variable.

Step 1. Identify what is different from the $ax + b = c$ format and get rid of it.

Order of Operations

- 1. Grouping
- 2. Exponentials
- 3. Multiply/Divide
- 4. Addition/Subtraction

from left to right

Solve the following equations.

1. $3x + 4 = 19$

2. $4x - 2 = 18$

3. $5x + 6 = 36$

4. $7x - 6 = 22$

5. $x/2 + 6 = 10$

6. $y/4 - 3 = 7$

7. $3x + 5 = 10 + 2x$

8. $7x - 5 = 4x + 1$

9. $10x - 3 = 6x + 21$

10. $9x + 6 = 2x - 15$

In the next group of problems, there are parentheses. The general strategy is to transform equations that you don't recognize into equations you do by using **Get Rid of It Strategy** using the Properties of Real Numbers. Since we have not done problems with parentheses, we get rid of them by using the Distributive Property, then go back to our original strategy – Order of Operations in reverse using the opposite operation.

11. $3(2x + 1) - 4 = 11$

12. $4(3x - 2) - 2x = 22$

13. $10 - 2(x - 4) = 12$

14. $3(2x - 3) + 4x = 5x + 16$

We can not make these more difficult, we can only make them longer! Get rid of the parentheses, combine like terms, and write equation in $ax + b = c$ format.

15. $5(2x + 3) - 2(x - 4) = 2x - 1$

16. $6x - 3(x - 8) = 4(x - 7) + 6$

SOLVING EQUATIONS

Muti-Step Equations

Use the **Get Rid of It Strategy** to transform the equation into the $ax+b=c$ format, then use the Order of Operations in reverse using the opposite operation to solve the equation.

Solve.

1. $5x - 4 + x = -34$

2. $-7y - 3 + 2y = 32$

3. $7t + 8 - 8t = 1$

4. $3p - 6 + 7p = -36$

5. $2m + 11 - 11m = -30 - 40$

6. $9x - 5x - 12 + 16 + 8$

7. $8x - 17 - 5x = -41$

8. $-11d - 5 + 20d = 49$

9. $14h + 8 - 4h = 71 + 7$

Multi-Step Equations

Use the **Get Rid of It Strategy** to transform the equation into the $ax+b=c$ format, then use the Order of Operations in reverse using the opposite operation to solve the equation.

A

1. $4x - 2 = 18$

2. $5x - 2 = 3x + 10$

3. $4(2x + 3) = 36$

4. $-2(5x + 2) = 6$

5. $4x + 3 = 5x - 6$

6. $2x + 3x - 4 = 26$

B

$5x + 3 = 43$

$7x + 3 = 3x - 17$

$2(3x + 5) = 40$

$-3(2x - 4) = 36$

$2x - 3 = 5x + 9$

$7x - 2x - 5 = x + 7$

C

$\frac{x}{2} - 3 = 6$

$6x + 8 = 2x + 4$

$5(2x - 3) + 5 = 20$

$2x + 3(2x + 5) = 39$

$3x + 4 = 7x + 4$

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

MULTI-STEP EQUATIONS

Muti-Step Equations

Use the **Get Rid of It Strategy** to transform the equation into the $ax+b=c$ format, then use the Order of Operations in reverse using the opposite operation to solve the equation.

Solve.

1. $3(y - 2) = 5y + 6$

2. $\frac{6(x+1)}{3} = 18$

3. $4x + 3x = 18 + x$

4. $7(x - 3) = 5x - 7$

5. $\frac{n+3}{-2} = 5 - n$

6. $4(2x - 7) = 14x - 2$

7. $8 - 3x = 12 - (4x + 5)$

8. $-2(3x - 1) + 4 = -5x + 2$

Multi-Step Equations

Use the **Get Rid of It Strategy** to transform the equation into the $ax+b=c$ format, then use the Order of Operations in reverse using the opposite operation to solve the equation.

A

B

C

1) $4x - 2 = 18$

$5x + 3 = 43$

$\frac{x}{2} - 3 = 6$

2) $5x - 2 = 3x + 10$

$7x + 3 = 3x - 17$

$6x + 8 = 2x + 4$

3) $4(2x + 3) = 36$

$2(3x + 5) = 40$

$5(2x - 3) + 5 = 20$

4) $-2(5x + 2) = 6$

$-3(2x - 4) = 36$

$2x + 3(2x + 5) = 39$

5) $4x + 3 = 5x - 6$

$2x - 3 = 5x + 9$

$3x + 4 = 7x + 4$

6) $2x + 3x - 4 = 26$

$7x - 2x - 5 = x + 7$

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