Important Rules for Solving Equations

- When you solve an equation, your goal is to get the variable alone by itself on one side of the equation. In other words, you are trying to isolate the variable.

- When you are solving for a variable, you MUST use inverse operations

- Draw a line to separate both sides of the equation.

Important Rules for Solving Equations (Continued)

- Whatever you do to one side of an equation, you must do to the other side of the equation. In other words, you must keep the equation balanced.

Think of solving an equation like lifting weights

- If you add or subtract weight from one side of the barbell, you must add or subtract weight from the other side to keep it balanced!

Solve: **r + 16 = -7**

- To solve, you must isolate the variable.
- What number is on the same side as **r**?
- To get **r** by itself, we must undo the addition. What is the opposite of addition?

1. Draw a line to separate the equation into 2 sides.
2. Subtract 16 from both sides.
3. Check your answer by substituting your answer back into the problem.

$r + 16 = -7$

$-16 \quad -16$

$r = -23$

1. Draw a line to separate the equation into 2 sides.
2. Subtract 2 from both sides.
3. Check your answer by substituting your answer back into the problem.

$x + 2 = -3$

$-2 \quad -2$

$x = -5$

$-5 + 2 = -3$

$-3 = -3$

Solve: $y + (-3) = -8$

$+3 \quad +3$

$y = -5$

Check Your Answer:

Solve: $x - (-2) = 1$

$x + 2 = 1$

$-2 \quad -2$

$x = -1$

Check Your Answer:

Solve: $-11 = t + (-2)$

$+2 \quad +2$

$-9 = t$

Solve: $-22 = c - 12$

$+12 \quad +12$

$-10 = c$

$c = -10$

Solve: $3.4 + x = -9.08$

$-3.4 \quad -3.4$

$x = -12.48$

Check Your Answer:

Solve: $x - (-2.98) = -11.5$

$x = -14.48$

It's everyday bro

Check Your Answer:

$x + 2.98 = -11.5$

$-2.98 \quad -2.98$

$x =$

Solve: $x + \left(-\frac{1}{4}\right) = \frac{5}{6}$

Check Your Answer:

Solve: $x - \left(-\frac{2}{3}\right) = -\frac{5}{6}$

Check Your Answer:

Solve: **-2p = 6**

- To solve, you must isolate the variable.
- What number is on the same side as **p**?
- To get **p** by itself, we must undo the multiplication. What is the opposite of multiplication?

1. Draw a line to separate the equation into 2 sides.
2. _____ by ____ on both sides.
3. Check your answer by substituting your answer back into the problem.

$-2p = 6$

$\frac{z}{-2} = 14$

1. Draw a line to separate the equation into 2 sides.
2. _____ by ____ on both sides.
3. Check your answer by substituting your answer back into the problem.

Solve: -16 = -4b

Check Your Answer:

Solve: $\frac{x}{6} = -29$

Check Your Answer:

Solve: - x = -4

Solve: - g = 16

Solve: $-\frac{3}{4}x = \frac{5}{8}$

Check Your Answer:

Solve: $-\frac{4}{7}x = -\frac{2}{3}$

Check Your Answer:

Solve: $\frac{x}{10} = -1.41$

Check Your Answer:

Solve: $-24.99 = 2.1m$

Check Your Answer:

Hint: Dividing by a fraction is the same as multiplying by the _____

Equations with Square and Cube Roots

-Isolate the variable by performing the inverse operation

x^2 and $\sqrt{x}$ are inverse operations.

x^3 and $\sqrt[3]{x}$ are inverse operations.

Cube Roots

$1^3 = 1$ $\quad \sqrt[3]{1} = 1$

$2^3 = 8$ $\quad \sqrt[3]{8} = 2$

$3^3 = 27$ $\quad \sqrt[3]{27} = 3$

$4^3 = 64$ $\quad \sqrt[3]{64} = 4$

$5^3 = 125$ $\quad \sqrt[3]{125} = 5$

Example 1

$\sqrt{x} = 15$

-Eliminate the square root by _____ both sides

Example 2

$\sqrt[3]{x} = 8$

-Eliminate the cube root by _____ both sides

Example 3

$x^2 = 64$

-Eliminate the exponent by taking the _____ _____ on both sides

Example 4

$x^3 = 8$

-Eliminate the exponent by taking the _____ _____ on both sides

Example 5

$x^3 = 64$

Example 6

$x^2 = 4$

Can you find the square root or cube root of a negative number? Why or why not?

Solve:

a) 6 less than a number is 18.

$x - 6 = 18$ $\quad x - 6 + 6 = 18 + 6$ $\quad x = 24$

b) 5 less than half a number is 40.

$\frac{1}{2}x$ $\quad \frac{x}{2} - 5 = 40$

$+5 \quad +5$

$\frac{2}{1}\frac{1}{2}x$ $\quad \frac{2}{1}\frac{x}{2} = 45 \cdot 2$ $\quad x = 90$