

Order of Operations/Linear Equations

1) A few things we need to remember:

A. Order of Operations

- Paranthesis
- Exponents
- Multiply/Divide
- Add/Subtract

→ $3 - 6 + 5$ $12 \div 2 \cdot 5$

(Handwritten annotations: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30)

$12 \div 3$ $-4 \cdot 5$

(Handwritten annotations: 1, 2, 3)

B. Grouping Symbols (these function just like Paranthesis)

Examples of Grouping Symbols:

- Absolute Value $| \quad |$
- Roots $\sqrt{\quad}$
- Brackets $[\quad]$
- Fractions (Numerator/Denominator) (\quad)

$| -5 + 3 |$ $\sqrt{36}$ $\sqrt{20 + 5}$

$\left(\frac{8 + 4}{2 \cdot 6} \right) = \frac{12}{12} = 1$

Evaluate each expression.

2) $(15 - 5 + 2) \div 3 \cdot 6$
 $(10 + 2) \div 3 \cdot 6$
 $12 \div 3 \cdot 6$
 $4 \cdot 6$
 24

3) $(5 \div (6 - 1) + 1) \cdot 6$
 12

4) $6 - (4 + 5 - (2 + 2))$
 $6 - (4 + 5 - 4)$
 $6 - (9 - 4)$
 $6 - 5 = 1$

5) $3(5 + 4) - (2 + 5)$
 $3(9) - 7$
 $27 - 7$
 20

6) $\frac{18}{-6 - 1 + 4 + 16}$
 $\frac{18}{-7 + 4 + 6}$
 $-\frac{18}{-3 + 6} = -\frac{18}{3} = -6$

7) $\frac{(-10 + 5) \cdot 2}{2} \cdot -2$
 $\frac{-5 \cdot 2}{2} \cdot -2$
 $\frac{-10}{2} \cdot -2 = -5 \cdot -2$
 10

8) $3^2 - \frac{4}{-4} + 2 - (4 + 3 - 2)$
 $(-2)(-2) = (-2)^2$

9) $5 - (4)(-3) - 3 - ((-3)^2 - 6)$
 $-2^2 = -(2)(2)$
 -4

10) $-6 \div 2 - \left(\frac{12 \cdot 2}{(-2)^2} \right) = 4$
 $-6 \div 2 - \left(\frac{24}{4} \right)$
 $-6 \div 2 - 6$
 $-4 - 6 = -10$

11) $3 \cdot 6 \cdot \left(\frac{8}{4 - 3 - 5} \right)$
 $3 \cdot 6 \cdot \left(\frac{8}{-4} \right) = 36$
 $3 \cdot 6 \cdot \left(-\frac{2}{1} \right) = 3 \cdot 6 \cdot (-2)$

12) C. Solving Linear Equations

Combine Like Terms

Use Order of Operations BACKWARDS to UNDO operations

SHOW YOUR WORK ON EVERY STEP

Solve each equation.

13) $-2x + 1 + 6 = -1$

$$\begin{array}{r} -2x + 7 = -1 \\ -7 \quad -7 \\ \hline -2x = -8 \\ -2 \quad -2 \\ \hline x = 4 \end{array}$$

15) $-4m - 7(8 - 8m) = -368$

$$\begin{array}{r} -4m - 56 + 56m = 368 \\ -56 + 52m = -368 \\ +56 \quad +56 \\ \hline 52m = -312 \\ m = -6 \end{array}$$

17) $5(4 + 4x) = -28 + 8x$

$$\begin{array}{r} 20 + 20x = -28 + 8x \\ \quad 8x \quad -8x \\ \hline -20 + 12x = -28x \\ -20 \quad -20 \\ \hline 12x = -48 \\ x = -4 \end{array}$$

19) $-3(7 - 2x) - 1 = -22 + 6x$

$$\begin{array}{r} -21 + 6x - 1 = -22 + 6x \\ -22 + 6x = -22 + 6x \\ 0 = 0 \\ \text{all solutions} \end{array}$$

14) $-8p - 3p = 0$

$$\begin{array}{r} -11p = 0 \\ -11 \quad -11 \\ \hline p = 0 \end{array}$$

16) $-6r + 8(6 + 3r) = 174$

$$\begin{array}{r} -6r + 48 + 24r = 174 \\ 48 + 18r = 174 \\ -48 \quad -48 \\ \hline 18r = 126 \\ r = 7 \end{array}$$

18) $-6n + 2(3n + 6) = 8n + 4$

$$\begin{array}{r} -6n + 6n + 12 = 8n + 4 \\ -4 \quad -4 \\ \hline 8 = 8n \\ 1 = n \end{array}$$

20) $5(n - 6) = -34 + 5n$

$$\begin{array}{r} 5n - 30 = -34 + 5n \\ -5n \quad -5n \\ \hline -30 = -34 \\ \text{No Solution.} \end{array}$$