SYNTAX

How to show your work in math class.

Simplifying & Evaluating Expressions
Solving Equations & Inequalities

When simplify expressions:
The equal signs should be on left side.
For example:

Simplify:

$$\begin{aligned} & 3(x+2)+2x \\ &= 3(x)+3(2)+2x \\ &= 3x+6+2x \\ &= 3x+2x+6 \\ &= 5x+6 \end{aligned}$$

$$\begin{aligned} & 3(x+2)+2x \\ &= (x+2)+(x+2)+(x+2)+2x \\ &= x+x+x+2+2+2+x+x \\ &= 5x+6 \end{aligned}$$

When evaluating expressions:
Use ( ) when substituting.
For example:

Evaluate $-x+y+2x$ when $x = -3$ and $y = 7$

$$\begin{aligned} & -x+y+2x \\ &= -(-3)+7+2(-3) \\ &= 3+7+(-6) \\ &= 10+(-6) \\ &= 4 \end{aligned}$$

$$\begin{aligned} & -x+y+2x \\ &= \cancel{-x}+y+\cancel{2x}+x \\ &= y+x \\ &= 7+(-3) \\ &= 4 \end{aligned}$$

When solving equations:
Line up all equal signs.
For example:

$$\begin{aligned} & 2(x+4)=2 \\ & 2(x)+2(4)=2 \\ & 2x+8=2 \\ & 2x+8-8=2-8 \\ & 2x=-6 \\ & \frac{2}{2}x=\frac{-6}{2} \\ & x=-3 \end{aligned}$$

$$\begin{aligned} & 2(x+4)=2 \\ & (x+4)+(x+4)=2 \\ & 2x+8=2 \\ & 2x+8-8=2-8 \\ & 2x=-6 \\ & \frac{2x}{2}=\frac{-6}{2} \\ & x=-3 \end{aligned}$$

When solving inequalities:
Line up all inequality signs.
For example:

$$\begin{aligned} & 3y-2 \geq 2(y+2) \\ & 3y-2 \geq 2(y)+2(2) \\ & 3y-2 \geq 2y+4 \\ & 3y-2y-2 \geq 2y-2y+4 \\ & y-2 \geq 4 \\ & y-2+2 \geq 4+2 \\ & y \geq 6 \end{aligned}$$

$$\begin{aligned} & 3y-2 \geq 2(y+2) \\ & 3y-2 \geq 2(y)+2(2) \\ & 3y-2 \geq 2y+4 \\ & \cancel{2y}+y-2 \geq \cancel{2y}+4 \\ & y-2 \geq 4 \\ & y-2+2 \geq 4+2 \\ & y \geq 6 \end{aligned}$$

Guidelines & Strategies:

- Work vertically showing multiple methods side-by-side
- All work on the same line
- Line up all equal and inequality signs
- Use ( ) whenever substituting for variables
- Box your final answers
- Perform all scratch work on the side or on a separate sheet of paper
- Explicitly teach and model syntax
- Expect and give credit for proper syntax on all work
- Ask students if work passes the pen or pencil test (if all equal signs or inequalities line up with their pen or pencil)

MATH SYNTAX: How my math should look.

1. In **pencil**
2. **Copy** the **problems**
3. One equal sign, or inequality sign, per line
4. **Line up equal signs**
   a. Expressions: down the left side
   b. Equations: down the middle
   c. Inequalities: down the middle
5. **Show work** (like my teacher showed me in class)
6. **Box answers**
7. **Skip a line** between problems
8. **Work down** the page. When I get to the bottom, I start a new column at the top.

Example of Homework with Perfect Syntax:

Heading (like my teacher wants)

Assignment: page 45; numbers 9-13

9. $\frac{1}{2}+\frac{2}{3}$

$=\frac{1}{2}\bullet\frac{3}{3}+\frac{2}{3}\bullet\frac{2}{2}$

$=\frac{3}{6}+\frac{4}{6}$

$=\boxed{\frac{7}{6}}$

10. $\frac{3}{4}x=6$

$\frac{4}{3}\left(\frac{3}{4}x\right)=\frac{4}{3}(6)$

$x=\frac{4\bullet 3\bullet 2}{3}$

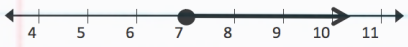
$\boxed{x=8}$

11. $5-x\le -2$

$5-x-5\le -2-5$

$-x\le -7$

$\boxed{x\ge 7}$



12. $2(x^2-3y);\text{ when } x=4 \text{ and } y=-2$

$=2[(4)^2-3(-2)]$

$=2(16+6)$

$=2(22)$

$=\boxed{44}$

13. The Area of a Triangle is 15 square feet. The height of the triangle is 5 feet. What is the base?

$A_\Delta=\frac{1}{2}bh$

$15=\frac{1}{2}b(5)$

$2(15)=2[\frac{1}{2}b(5)]$

$30=5b$

$\frac{30}{5}=\frac{5b}{5}$

$6=b$

$\therefore$ The base of the triangle is 6 feet.