

Skills Review for STAAR

I. Substitute.

When we substitute in algebra, we take out a variable in an expression and replace it with a number. Then we can simplify the expression or solve the equation.

Example 1: If $y = -\frac{4}{5}x - 2$, what is the value of x when $y = -9$?

$$\begin{array}{r}
 -9 = -\frac{4}{5}x - 2 \\
 +2 \quad +2 \\
 \hline
 -7 = -\frac{4}{5}x \\
 \div -\frac{4}{5} \quad \div -\frac{4}{5} \\
 \hline
 x = \frac{35}{4} \text{ or } 8.75
 \end{array}$$

Practice:

1. If $f(x) = 2x - 5$, what is $f(x)$ when $x = \frac{1}{2}$?

$$\begin{array}{l}
 f\left(\frac{1}{2}\right) = 2\left(\frac{1}{2}\right) - 5 \\
 \boxed{f\left(\frac{1}{2}\right) = -4}
 \end{array}$$

2. In the linear function $y = -x - 3$, what is the value of x when $y = -1$?

$$\begin{array}{r}
 -1 = -x - 3 \\
 +3 \quad +3 \\
 \hline
 2 = -x \\
 \div -1 \quad \div -1 \\
 \hline
 \boxed{-2 = x}
 \end{array}$$

II. Simplify.

To simplify means to distribute and combine like terms. CLT

Example 2: Simplify the expression $0.5(-12c + 6) - 3(c + 4) + 10(c - 5)$.

$$\begin{array}{l}
 \overset{\curvearrowright}{0.5(-12c+6)} \quad \overset{\curvearrowright}{-3(c+4)} \quad \overset{\curvearrowright}{+10(c-5)} \\
 \boxed{-6c + 3 - 3c - 12 + 10c - 50} \quad \text{CLT} \\
 \boxed{c - 59}
 \end{array}$$

Practice:

3. Simplify the expression $-3(2x-5) + \frac{2}{5}(10x+15)$. Distribute

$$\begin{array}{l} \boxed{-6x} + \boxed{15} + \boxed{4x} + \boxed{6} \\ \hline \boxed{-2x + 21} \end{array}$$

4. Which expression is equivalent to $\frac{12x^6y^{-4}z^2}{3x^2y^{-6}z^3}$?

1) Divide coefficients
2) subtract exponents

A. $\frac{9x^8z^5}{y^{-10}}$

B. $\frac{4x^8z^5}{y^{-10}}$

C. $\frac{9x^4y^2}{z}$

D. $\frac{4x^4y^2}{z}$

$$\frac{4x^4y^2}{z}$$

$$x^{6-2} = x^4$$

$$y^{-4-(-6)} = y^2$$

$$z^{2-3} = z^{-1} = \frac{1}{z}$$

$$\frac{12}{3} = \frac{4}{1} = 4$$

III. Solve.

We can only solve if we have an equation or an inequality. Solving means finding values for the variables.

Example 3: Solve for x: $3(x-3) + 7 = 13$

1) Simplify - DISTR
- CLT
2) Isolate the variable

DISTRIBUTE
 $3x - 9 + 7 = 13$ CLT

solve for x

$$\begin{array}{r|l} 3x - 9 + 7 & = 13 \\ +2 & +2 \\ \hline 3x & = 15 \\ \div 3 & \div 3 \\ \hline \boxed{x = 5} & \end{array}$$

Example 4: What is the value of x in the solution to the system of equations below?

set up for substitution since $x = \underline{\quad}$

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

$$\boxed{(5, 1)}$$

is an ordered pair

- 1) Graph $y_1 =$
 $y_2 =$
pt of intersection
- 2) Substitution
- 3) Elimination

$$\begin{aligned} (3y + 2) + 2y &= 7 && \text{CLT} \\ 5y + 2 &= 7 && \text{solve for } y \\ \underline{-2} & \quad \underline{-2} && \\ 5y &= 5 && \\ \underline{\frac{5y}{5}} & \quad \underline{\frac{5}{5}} && \\ y &= 1 && \end{aligned}$$

now find x

$$\begin{aligned} x &= 3y + 2 \\ x &= 3(1) + 2 \\ \boxed{x} &= 5 \end{aligned}$$

Practice:

5. What is the value of x in the solution to the system of equations below?
Elimination or FSS with each answer

$$\begin{aligned} 6x + 3y &= 13 \\ 3(3x - y) &= 4 \end{aligned}$$

$$\begin{aligned} 6x + 3y &= 13 \\ + 9x - 3y &= 12 \\ \hline 15x &= 25 \\ \frac{15x}{15} &= \frac{25}{15} \\ \boxed{x} &= \frac{5}{3} \end{aligned}$$

- F. 1
- G. $\frac{5}{3}$
- H. $\frac{8}{3}$
- J. $\frac{7}{3}$

~~cancel~~

More STAAR Problems-

x : cupcakes
 y : cookies

6. A high school band held a bake sale. The number of cupcakes sold was four more than twice the number of cookies sold. The band sold a total of 52 cupcakes and cookies. How many cupcakes were sold?

F. 28

G. 16

H. 36

J. 24

Substitution

$$x = 2y + 4$$

$$x + y = 52$$

$$(2y + 4) + y = 52$$

$$3y + 4 = 52$$

$$\begin{array}{r|l} 3y + 4 & = 52 \\ -4 & -4 \\ \hline 3y & = 48 \\ \hline y & = 16 \end{array}$$

cupcakes

$$x = 2(16) + 4$$

$$x = 36$$

cookies

IV. Graphing

7. The set of ordered pairs below represents some points on the graph of function f .

$$\{(3,11), (-1,3), (5,15), (-4,-3), (-7,-9)\}$$

What is the parent function of f ?

F. $y = x$

G. $y = 2^x$

H. $y = x^2$

J. $y = \sqrt{x}$

(Hint: Use graph paper.)

Graph

| | x | y | |
|----|------|-----|------|
| +3 | < -7 | -9 | > +6 |
| +3 | < -4 | -3 | > +6 |
| +3 | < -1 | 3 | > +8 |
| +4 | < 3 | 11 | > +4 |
| +2 | < 5 | 15 | > +4 |

$\frac{16}{3} = \frac{16}{3} = \frac{16}{3} = \frac{16}{3} = \frac{16}{3}$

1st difference

is constant

so Linear