2.1 Variables in Expressions and Equations - Worksheet 1

1 Determine the value of $3x - 5$ when $x = 4$, $x = 9$, and $x = -5$. Write your results as if-then statements.

2 Solve $y + c = 7$ for y using a complete presentation.

3 Solve $x^2 + c = 7$ for x^2 using a complete presentation.

How did you solve $y + c = 7$ for the variable y? Do the same thing here.

4 Solve the equation $ax + b = c$ for the variable x using a complete presentation.

One of the biggest hurdles for students in math is a lack of self confidence to the point that they shut down without even trying. Trust yourself that you have the knowledge and experience to solve this one, and just give it a try.

2.2 Variables in Expressions and Equations - Worksheet 2

1 Determine the value of $2x - 5y$ when $x = 4$ and $y = 2$, and when $x = 2$, and $y = -3$. Write your results as if-then statements.

There is no example in the book for how to deal with two variable substitutions at the same time, but you can figure it out.

For the "then" part of your sentence, you only need to say $2x - 5y = $ (number). We'll discuss the presentation of this later.

2 Check the presentation for errors. If you find one, circle it and describe the mistake in words.

$$2x + 4y = 10$$

$$4y = 2x + 10 \qquad \text{Add } 2x \text{ to both sides}$$

$$y = \frac{2x + 10}{4} \qquad \text{Divide both sides by } 4$$

$$y = \frac{2x}{4} + \frac{10}{4} \qquad \text{Rewrite the fraction}$$

$$y = \frac{x}{2} + \frac{5}{2} \qquad \text{Reduce}$$

Hint: In this problem, there's nothing wrong with the fraction manipulations. You can use that part of the calculation as a model for future problems.

Eventually, the dividing and rewriting should be something you can do mentally in one step. Whether you rewrite the one fraction as two separate fractions will depend on the context.

3 Solve the equation $2x + 3y = 6$ for the variable y using a complete presentation.

This is a common type of calculation when working with equations of lines. We'll see more of this later.

4 Solve the equation $2x + 3y = 6$ for the variable x using a complete presentation.

This looks a lot like the previous problem. Pay attention to the details of the wording in the instructions.

2.3 Variables in Expressions and Equations - Worksheet 3

1 Determine the value of x^2 when $x = 0$, $x = 4$, and $x = -3$. Write your results as if-then statements.

Recall that $x^2 = x \cdot x$.

What happens if you multiply a negative number by another negative number?

2 Solve $4x - 3y = 6$ for y using a complete presentation.

Be careful with your negative signs. Remember that $\frac{a}{-b} = -\frac{a}{b}$.

3 Solve $ax + by = c$ for y using a complete presentation.

4 Work backwards from the given information to derive the original presentation.

Try not to feel overwhelmed. If you've done the worksheets up to this point, you can do this one.

Add c to both sides

$$a = \frac{b + c}{d}$$

Divide both sides by d

2.4 Variables in Expressions and Equations - Worksheet 4

1 Determine the value of $x^2 + 2y^2$ when $x = -1$ and $y = 2$, and when $x = -2$ and $y = -1$. Write your results as if-then statements.

2 Solve $ax + by = c$ for x using a complete presentation.

3 Solve the equation $3x - 2y - 4z = 24$ for the variable z using a complete presentation.

This is not dramatically different the two variable problems. Trust yourself and give it a try.

2.5 Variables in Expressions and Equations - Worksheet 5

1 Solve the equation $(x - 5) + a = b$ for the expression $(x - 5)$.

This may seem odd right now, but being able to solve for a complicated variable expression is an important skill to develop.

2 Solve the equation $3(y + 3) + a = b$ for the expression $(y + 3)$.

Think of the entire set of parentheses as a single object. Do not distribute the 3.

3 Work backwards from the given information to derive the original presentation.

This is a challenging problem! You may want to look back at some of the problems on previous worksheets in this section.

When you're done, you should check your work by reading it from top to bottom.

Add 4 to both sides

Divide both sides by 6

Rewrite the fraction

$$a = \frac{b}{6} + \frac{2}{3}$$ Reduce

Hint: The $\frac{2}{3}$ was the part that was reduced.