

Four Approaches to Solving an Equation

Four students approach the following task in different ways.

Solve: $2x - 5 = -x + 4$

Part I: Analyze each student's approach. What does each student understand about finding a solution to an equation in 1 variable? What are the benefits/drawbacks to each solution strategy?

Shane:

X	$2x-5$	$-x+4$
0	$2(0) - 5 = -5$	$-0+4=4$
1	$2(1) - 5 = -3$	$-1+4=3$
2	$2(2) - 5 = -1$	$-2+4=2$
3	$2(3)-5 = 1$	$-3+4=1$
4	$2(4)-5 = 3$	$-4+4=0$

When I put in bigger values for X, $2X-5$ goes up by 2 each time, and $-x+4$ goes down by 1. It looks like the only time that you will get the same answer is when $x=3$ and the answer is 1 for both sides.

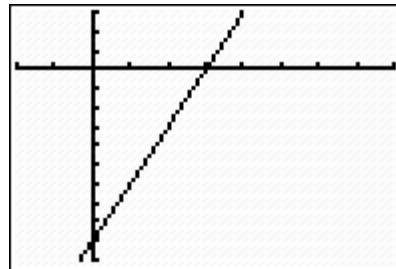
Tanya:

$$2x-5=-x+4$$

$$3x-9=0$$

$$y=3x-9$$

Graph the function. The line intersects the x-axis at 3, so answer is $x=3$



Bonnie:

I can rewrite $2x-5=-x+4$ as $3x-5 = 4$

Then I thought "What times 3 is 5 more than 4?"

5 more than 4 is 9, so it must be 3 times 3.

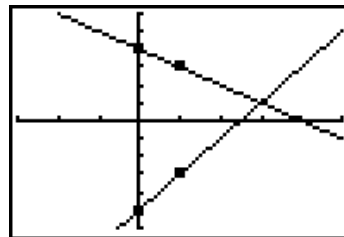
Andy:

$$2x-5=-x+4$$

$$\text{graph } y=2x-5$$

$$\text{graph } y=-x+4$$

The graphs intersect at (3,1). answer (3,1)



Part II: How would you predict each of these students would solve the following task?

Solve $4(x+1) = 4x + 1$

Do any of the students' approaches make the solution to this equation more understandable? Why or why not?