F.BF.A.1-Allowance Plans

Alignment to Content Standards

CCSS.Math.Content.HSF.BF.A.1

Tasks

Jessica and Sam are trying to save money. Jessica already has saved 150 dollars. Sam has saved up 250 dollars. They both receive an allowance from their parents. Jessica gets 15 dollars a week. Sam parents give him 50 dollars every three weeks but he gives his little two sisters 10 dollars each every time he gets allowance. Create equations in terms of *T* for total money saved and *w* for weeks saved to determine who has the better allowance plan?

Commentary

This task assesses F.BF.A.1because students will have to build functions in order to solve the problem. The students will have to identify based on the problem the intercepts as well as identify what the slope of the lines are. The students will be developing equations based on a word problem which can be difficult. Sam’s equation will be more difficult because there is the two sisters that need to be accounted for in the problem. The sister will change the slope of the equation. The students will have to look at the slope of the lines in order to see who has the better savings plan.

Solution

For Jessica’s equation we are given that she has saved 150 dollars. So we know that the y-intercept in her equation will be 150. We are also given that she gets 15 dollars a week from her parents. The 15 dollars will be the slope in the equation. So in terms of *T* and *w* her equation will look like

*T*=15*w*+150

We can see that Jessica’s equation has a slope of 15 which will be important when we look at who has the better plan in the long run.

For Sam’s equations we are given that she has saved 250 dollars. So we know that the y-intercept in his equation is 250. For Sam’s slope we know that he gets 50 dollars every three weeks and that he gives 10 dollars to each of his sisters every time he gets allowance. So to find Sam’s slope we need to subtract 20 dollars from 50 dollars. Then we must divide that amount by three to get his allowance a week. His equation will look like

*T*=$\frac{50-20}{3}$*w*+250

This then will simplify to

*T*=10*w*+250

We see that Sam’s equation has a slope of 10 which is smaller than Jessica’s

In order to find who has the better allowance plan we will look at the slopes from each equation. We will see that Jessica’s equation has a larger slope than Sam. This means that the end behavior of Jessica’s equation will be greater than the end behavior of Sam’s.

Therefore Jessica has the better allowance plan.