**8.EE.B / 8.F.A. / HSA-CED.A Time to Sell Some Cars**

**8.EE.B.5.** (Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.)

### 8.F.A.2. (Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.)

**HSA-CED.A.2** (Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

Kim and Tim are car sales associates at Ellensburg Ford dealership. Kim makes an annual salary of $37,000 per year. She also makes an average of $3,000 dollars in benefits/commissions per month. Tim on the other hand makes $41,000 per year and gets $2,000 dollars in benefits/commissions.

Tasks:

1. Write an equation for each sales associate to find out how much each of them will make at any month throughout the year.
2. Who do you predict will have the most money at the end of the year? Why?
3. Graph each of the equations from part a.
4. At what month do Tim and Kim make the same amount of money?
5. Which sales associate makes the most at the end of the year?

Commentary:

This task focuses on many mathematical concepts in order to reach a solution. Students must be able to take the information given in the scenario to create linear equations to represent the projected amount each sales associate will make for each month and the overall year. Students must also be able to create a graph with lines representing the linear equations for each of the sales associates. In order to find the exact month that Tim and Kim make the same amount of money, the student must find the total amount of money made for each month 1-12 and then be able to compare the amounts to see when they are equal. Finally, students must be able to make predictions and then find an answer based on their graphs as to which sales associate made more money after one year.

Solution:

1. Kim: y = 3,000x + 37,000

Tim: y = 2,000x + 41,000

Let y represent the total amount after any given month throughout the year

Let x represent the month.

1. (Students answers may vary)

I predict that Kim will have the most money at the end of the year because even though her overall salary is less than Tim’s, her rate of benefits/commissions per month will put her at the top after 12 months.

**Money ($)**

**Month**

1. Tim and Kim make the same amount of money in April which is the 4th month of the year.

Kim: y = 3,000(4) + 37,000

12,000 + 37,000

$49,000

Tim: y = 2,000(4) + 41,000

8,000 + 41,000

$49,000

1. Kim makes the most money at the end of the year with $73,000.

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| --- | --- | --- |
| **Month** | **Tim** | **Kim** |
| January | $ 43,000 | $ 40,000 |
| February | $ 45,000 | $ 43,000 |
| March | $ 47,000 | $ 46,000 |
| April | **$ 49,000** | **$ 49,000** |
| May | $ 51,000 | $ 52,000 |
| June | $ 53,000 | $ 55,000 |
| July | $ 55,000 | $ 58,000 |
| August | $ 57,000 | $ 61,000 |
| September | $ 59,000 | $ 64,000 |
| October | $ 61,000 | $ 67,000 |
| November | $ 63,000 | $ 70,000 |
| December | $ 65,000 | **$ 73,000** |