**Starting Value** - Y-intercept

**Rate of Change** – Slope

The function y = 2.25 + 0.75x shows the cost of an ice cream sundae with different toppings (x).

a.) What is the starting value and what does it mean?

**$2.25 – You have to pay $2.25 for a sundae without toppings.**

b.) What is the rate of change and what does it mean?

**$0.75 – Each topping costs $0.75.**

The function y = 50x + 100 shows the amount of money that Colby would have in her savings account after (x) years.

a.) What is the starting value and what does it mean?

**$100 – Colby has $100 in her savings account to start.**

b.) What is the rate of change and what does it mean?

**$50 – Colby has $50 more in her account every year.**

Kelly wants to add new music to her MP3 player. Another subscription site offers its downloading service where the total monthly cost is a fixed fee of $6.00 and it costs $0.25 per song.

a.) Identify and interpret the starting value.

**$6.00 – You have to pay $6.00 before you download any songs.**

b.) Identify and interpret the rate of change.

**$0.25 – It costs $0.25 for each song.**

c.) Let x represent the number of songs downloaded and y represent the total monthly cost in dollars. Construct a function to model the relationship between the number of songs downloaded and the total monthly cost.

**y = 0.25x + 6**

One site offers MP3 downloads of individual songs with the following price structure: a $4 fixed fee for monthly subscription PLUS a charge of $0.20 per song.

a.) Identify and interpret the rate of change.

**$0.20 – It costs $0.20 for each song.**

b.) Identify and interpret the starting value.

**$4 – It costs $4 before you download any songs.**

c.) Let x represent the number of songs downloaded and y represent the total monthly cost in dollars. Construct a function to model the relationship between the number of songs downloaded and the total monthly cost.

**y = 0.20x + 4**

It costs 1.90 for a hamburger and 1.40 for each additional topping.

a.) Identify and interpret the rate of change.

**$1.40 – It costs $1.40 for each topping.**

b.) Identify and interpret the initial value.

**$1.90 – It costs $1.90 for a hamburger with no toppings.**

c.) Write a linear function that represents the cost for a hamburger.

**y = 1.40x + 1.90**

It costs $5 to get into the fair and $1.75 per ride.

a.) Identify and interpret the rate of change.

**$1.75 – It costs $1.75 per ride.**

b.) Identify and interpret the initial value.

**$5 – It costs $5 to get into the fair.**

c.) Write a linear function that represents the cost for the fair and rides.

**y = 1.75x + 5**

Tom bought a car that cost $25,000. Every year the value of the car decreases $1,000.

a.) Identify and interpret the rate of change.

**-$1,000 – The value of the car decreases $1,000 every year.**

b.) Identify and interpret the starting value.

**$25,000 – The car originally cost $25,000.**

c.) Write a function that represents the total cost of the car after (x) years.

**y = -1000x + 25000**

Kara is going to open a savings account, but has no money to put in the account to start. She is planning on contributing $500 each month to her savings account. Let x represent the number of months and let y represent the total amount of money in her savings account.

a.) Identify and interpret the rate of change.

**$500 – This is the amount of money that she contributes each month.**

b.) Identify and interpret the initial value.

**$0 – Kara had no money in her account to start.**

c.) Write a linear function that represents the amount of money in Kara's account.

**y = 500x**

d.) Is the amount of money in her account increasing or decreasing? Explain.

**Increasing because the slope is positive.**

Saul collects porcelain figures. Let y represent the figure’s resale value (in dollars) and x represent the number of years since purchase. Each figure’s resale value after 0, 1, 2, 3 and 4 years could be modeled by linear equations as follows:

Figure A: y = 5 – 3x

Figure B: y = 8 + 2.5x

Figure C: y = -4x + 9

Figure D: y = 1.2x + 7

Figure E: y = 10 – 8x

a.) Which figure(s) are decreasing in value each year? How can you tell?

**Figures A, C & E are decreasing in value because they have a negative rate of change.**

b.) Which figure(s) had the greatest initial value at purchase? What was the initial value?

**Figure E have the greatest initial value, which is $10.**

c.) Which figure(s) is increasing in value the fastest from year to year? How can you tell?

**Figure A is increasing in value the fastest because it has the greatest rate of change.**

d.) What does the 2.5 value represent in Figure B’s equation?

**The value of the figure increases by $2.50 every year.**

e.) What does the 9 value represent in Figure C’s equation?

**Figure C originally cost $9.**

f.) If you were to graph the equations of the resale values of Figures A & B, which figure’s graph line would be steeper? How can you tell?

**Figure A would be steeper because it has a higher rate of change so it will go up faster.**

g.) What do the 1.2 and the 7 represent in the equation for Figure D?

**Figure D originally cost $7 and is increasing $1.20 in value each year.**