- **Rate of Change:** Slope with words   "per"
  (m) CROC   "65 miles per hour" UfO $\frac{y}{x}$ y per x
  $\underset{y}{\qquad}$ $\underset{x}{\qquad}$
- **Initial Value:**
  (b) Starting amount, y-int x=0 (0,)

Ex. 1: You get a new babysitting job that pays $7.57 per hour. You already have $12.65 in your wallet. Write an equation that models the amount of money you have in your wallet (y), for the amount of hours you work (x).

- **Rate of Change:** $\underset{y}{\$7.57}$ per $\underset{x}{hour}$

- **Initial Value:** $12.65
  y-int

  $y = mx + b$

- **Equation:** $y = \boxed{7.57}x + \boxed{12.65}$

- How much money is in your wallet after you babysit 306 hours during the summer?

  $y = 7.57(306) + 12.65$
  $2316.42 + 12.65$ $y = \$2329.07$

Ex. 2: Mark buys a house that has a patio partially completed in the backyard. As his first project, he is going to finish the patio. The patio already has 23 bricks in it. He thinks he can lay 35 bricks per day. Write an equation to calculate how many bricks are on the patio according to how many days he has worked on it.

- x: Days
- y: # of bricks
- **Rate of Change:** $\underset{y}{35}$ brick per $\underset{x}{day}$
- **Initial Value:** 23 bricks
  y-int
- **Equation:** $y = 35x + 23$

Ex. 3: A new truck loses approximately $2,500 per year after you purchase it. It costs $36,000 brand new. Write a model to calculate the value of the truck after any amount of years since purchase. ↘ equation

- x: Years
- y: Dollars (value of the truck)
- Rate of Change: $-2,500$ per year
- Initial Value: $36,000
- Equation:

$$y = -2500x + 36000$$

Ex. 4: You and some friends are going out to eat and you're REALLY hungry! So you decide to go to a buffet. It costs $8 per person to eat at the buffet. Write an equation that models the cost of your meal (y) depending on how many plates of food you eat (x).

- x: Plates of food
- y: Cost of meal ($)
- Rate of Change: $0 per plate
- Initial Value: $8
- Equation:

$$y = 0x + 8$$
$$y = 8$$

Ex. 5: A library charges a late return fee for any book that is returned after the due date, plus a charge is added per day that a book is returned late. The table below shows the total fee (*y*) for a book returned any number of days late (*x*).

Days (*x*)	Total Fee, $ (*y*)
10	5.00
15	5.75
20	6.50
25	7.25

- Identify the constant rate of change for the situation.

  $0.15 per day

- Identify the initial value for the situation.

  $3.50

- Write the equation to model the situation, where *x* represents time in days and *y* is the total fee.

  $y = 0.15x + 3.50$

- What does the point (5, 4.25) mean in the context of the situation?
  - *x*-value describes: after 5 days of having a late book
  - *y*-value describes: the late fee is $4.25

- What values of the domain and range make sense for this situation?

  negative and fractions

Ex. 6: Brad just got a new phone. He sends an average of 50 texts per day.
- Identify the constant rate of change for the situation.

  50 texts per day

- Identify the initial value for the situation.

  y-int   0 texts

- Write the equation to model the situation, where *x* represents the number of days and *y* is the total number of texts.

  $y = 50x + 0$

- What does the point (7, 350) mean in the context of the situation?
  - *x*-value describes: 7 days he has his phone
  - *y*-value describes: 350 texts sent

Ex. 7: Katie makes bracelets to sell at a local craft fair. The equation
$T = 3n - 12$ describes this situation, where T represents her profit and n
represents the number of bracelets she sells.

$y = 3x - 12$

- Identify the constant rate of change for the situation.

  (m) $3 per bracket$

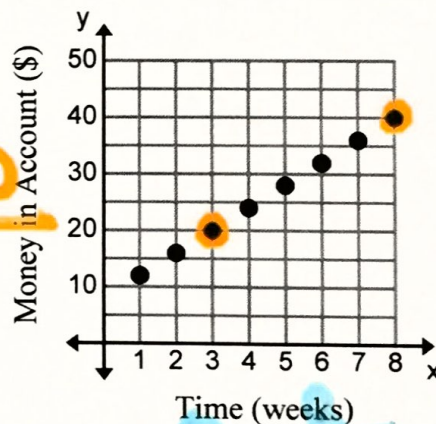- Identify the initial value for the situation.

  (b) -12

- What does the point (10, 18) mean in the context of the situation?
  - *x*-value describes: Sells 10 braclets
  - *y*-value describes: $18 profit

Ex. 8: Jesse is saving money for a school trip. The graph shows how much money
he has saved over a set of weeks.

- Identify the constant rate of change for the situation.

  $\dfrac{\$20}{\text{weeks}}$ $4 per week

  $\dfrac{40 - 20}{8 - 3}$

- Identify the initial value for the situation.

  $8

- Write the equation to model the situation, where x
  represents time in days and y is the total fee.

  $y = 4x + 8$

- What does the point (0, 8) mean in the context of the situation?
  - *x*-value describes: at 0 weeks
  - *y*-value describes: $8 saved

1	12
2	16
3	20

Ex. 9: The table shows the cost for an "Unlimited Fun Pass" for Boondocks, in Draper (y) based on the number of attractions you participate in (x).

# of Attractions (x)	2	5	7	8	11
Cost, $ (y)	25.95	25.95	25.95	25.95	25.95

- Identify the constant rate of change for the situation.

  $0 per attractions

- Identify the initial value for the situation.

  $25.95

- Write the equation to model the situation, where x represents the number of attractions you do and y is the total cost.

  $y = 25.95$

- What does the point (6, 25.95) mean in the context of the situation?
  - x-value describes: 6 attractions
  - y-value describes: costs $25.95