

1.3 Modeling with Linear Functions (Day 1)

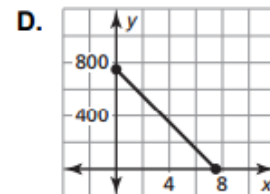
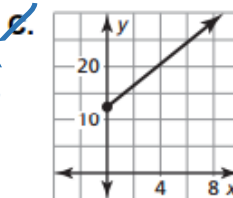
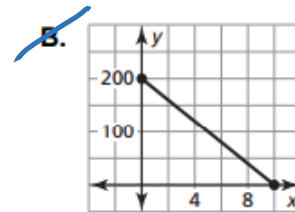
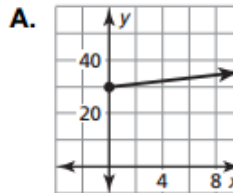
OBJ: Write equations of linear functions using points and slopes; Find lines of fit and lines of best fit

Essential Question: How can you use a linear function to model and analyze a real-life situation?

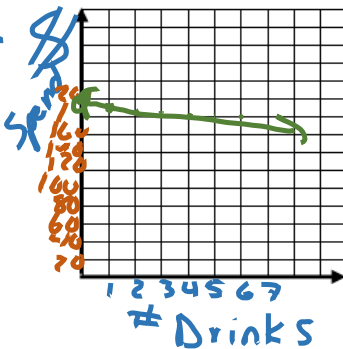
EXPLORATION: Modeling with Linear Functions

Work with a partner. Match each description of the situation with its corresponding graph. Explain your reasoning.

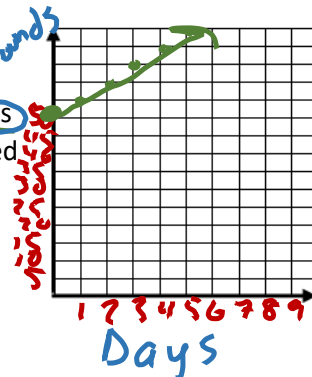
- a. A person gives \$20 per week to a friend to repay a \$200 loan. **B**
- b. An employee receives \$12.50 per hour plus \$2 for each unit produced per hour. **C**
- c. A sales representative receives \$30 per day for food plus \$0.565 for each mile driven. **A**
- d. A computer that was purchased for \$750 depreciates \$100 per year. **D**



1. A student with \$200 spends \$2 per day on a McDonald's drink, which is represented by the linear equation $f(x) = -2x + 200$. Graph the line.



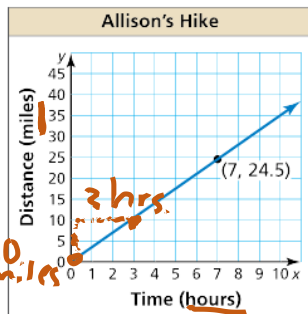
2. A student starts bench pressing 50 pounds and increases his weight 5 pounds per day, which is represented by the linear equation $f(x) = 5x + 50$. Graph the line.



Interpreting Linear Graphs

3. Allison is hiking in Eagle Creek Park. At what speed (slope or rate of change) is Allison hiking?

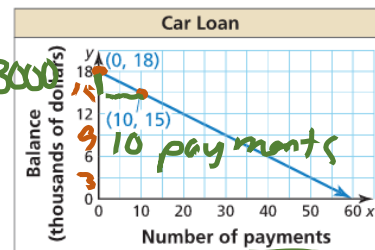
$$m = \frac{\text{Rise} \uparrow}{\text{Run} \rightarrow} = \frac{10 \text{ miles}}{3 \text{ hrs.}}$$



4. a) What is the starting balance of the car loan?
b) How much of the car loan balance do you pay off per payment (rate of change or slope)?

a) \$18,000

b.) $m = \frac{\text{Rise} \downarrow}{\text{Run} \rightarrow} = -\frac{3000}{10 \text{ payments}}$



5. a) What is the starting amount of money in your savings account? **\$10**

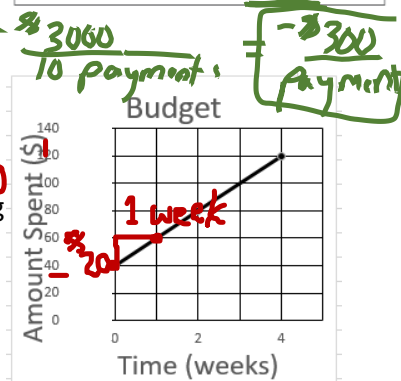
b) How much money are you saving per week (rate of change or slope)?

$$m = \frac{\text{Rise} \uparrow}{\text{Run} \rightarrow} = \frac{\$20}{1 \text{ week}}$$



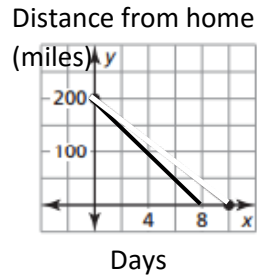
6. a) What is the starting amount of your budget? **\$40**
b) How much are you spending per week (rate of change or slope)?

$$m = \frac{\text{Rise} \uparrow}{\text{Run} \rightarrow} = \frac{\$20}{1 \text{ week}}$$

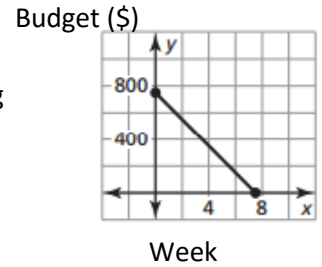


Interpret each scenario.

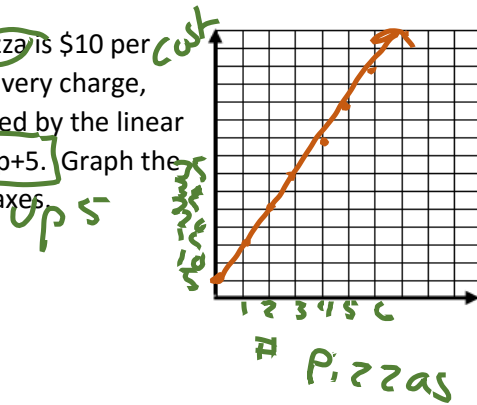
1. a) What is your starting distance from home?
- b) How fast are you riding your bike home (rate of change or slope)?



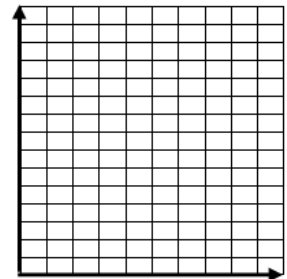
2. a) What is the starting amount of your budget?
- b) How much are you spending per week (rate of change or slope)?



3. The cost per pizza is \$10 per pizza plus a \$5 delivery charge, which is represented by the linear equation $C(p) = -10p + 5$. Graph the line and label the axes.



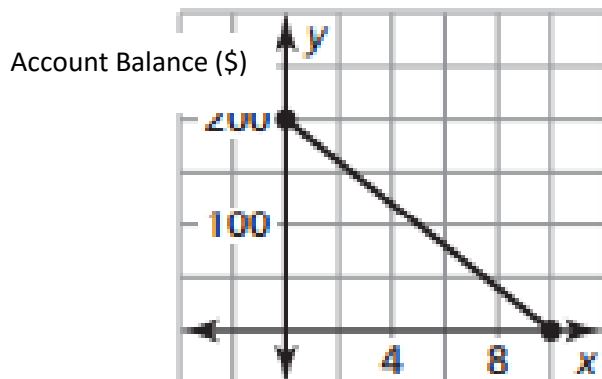
4. Cable TV costs \$100 per month plus a \$50 installation fee, which is represented by the linear equation $C(m) = 5m + 50$. Graph the line and label the axes.



Warm-Up

Find the

slope and interpret the slope.



Time (Days)