

Paper Practice 3.6

Sketching Graphs of Functions

Example 1

1. **CELL PHONE** Drew buys a cell phone and signs up for a monthly phone plan.

The total cost of the cell phone and plan can be represented by a function. Sketch a graph that shows the cost y , in dollars, as a function of time x , in months.

x-intercept: none

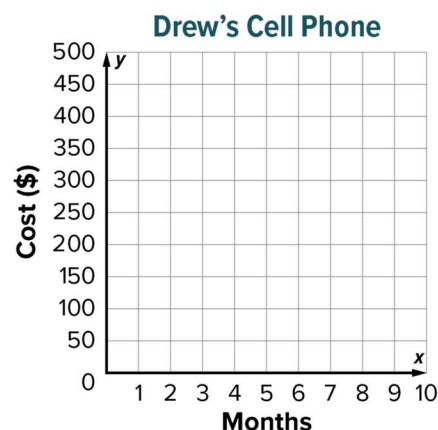
y-intercept: \$200

Linear or Nonlinear: The graph of the function is linear.

Positive: for time greater than 0 weeks

Increasing: for time greater than 0 weeks

End Behavior: As the number of months he has the phone increases, the amount he spends increases.



2. **WALKING** Sofia is keeping track of the distance she travels while on a walk.

The number of miles she walks can be represented by a function. Sketch a graph that shows the number of miles she walks y as a function of time x , in minutes.

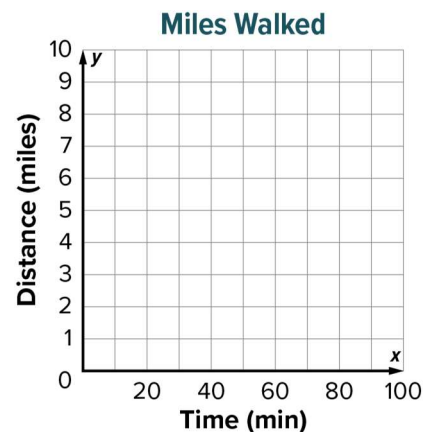
y-intercept: No miles are walked when she has walked for 0 minutes.

Linear or Nonlinear: The graph of the function is linear.

Positive: for time greater than 0 minutes

Increasing: for time greater than 0 minutes

End Behavior: As the number of minutes she has walked increases, the number of miles walked increases.



3. **MODEL ROCKET** The height of a model rocket after being launched can be represented by a function. Sketch a nonlinear graph that shows the height of the rocket y , in feet, as a function of time x , in seconds.

Positive: between 0 seconds and 12.5 seconds

Negative: for time greater than 12.5 seconds (*represents time after the ball hits the ground*)

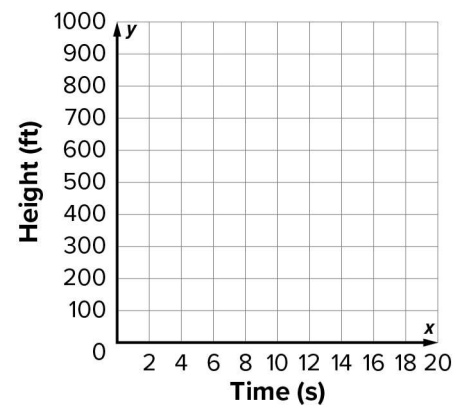
Increasing: for time less than 6.25 seconds

Decreasing: for time greater than 6.25 seconds

Relative Maximum: at 6.25 seconds, when the height is 625 feet

End Behavior: As the time increases, the height of the rocket decreases.

Symmetry: The height of the rocket between 0 seconds and 6.25 seconds is the same as the height of the rocket between 6.25 seconds and 12.5 seconds.



4. **CONCESSIONS** The number of people waiting in line at a concession stand can be modeled by a function. Sketch a graph that shows the number of people waiting in line y as a function of the time since opening x , in hours.

Positive: for time between 0 hours and 4.5 hours

Negative: for time less than 0 hours and greater than 4.5 hours (*represents time before the stand opens and after it closes*)

Increasing: from 0 hours to about 0.7 hours and from about 1.6 hours to about 3.6 hours

Decreasing: from about 0.7 hour to about 1.6 hours and for time greater than about 3.6 hours

Intercepts: The graph intercepts the x -axis at $(0, 0)$ and $(4.5, 0)$.

Relative Minimum: at about $(1.6, 3.5)$

Relative Maximum: at about $(0.7, 4.8)$ and $(3.6, 13.3)$

End Behavior: As the time increases or decreases, the number of people waiting decreases.

