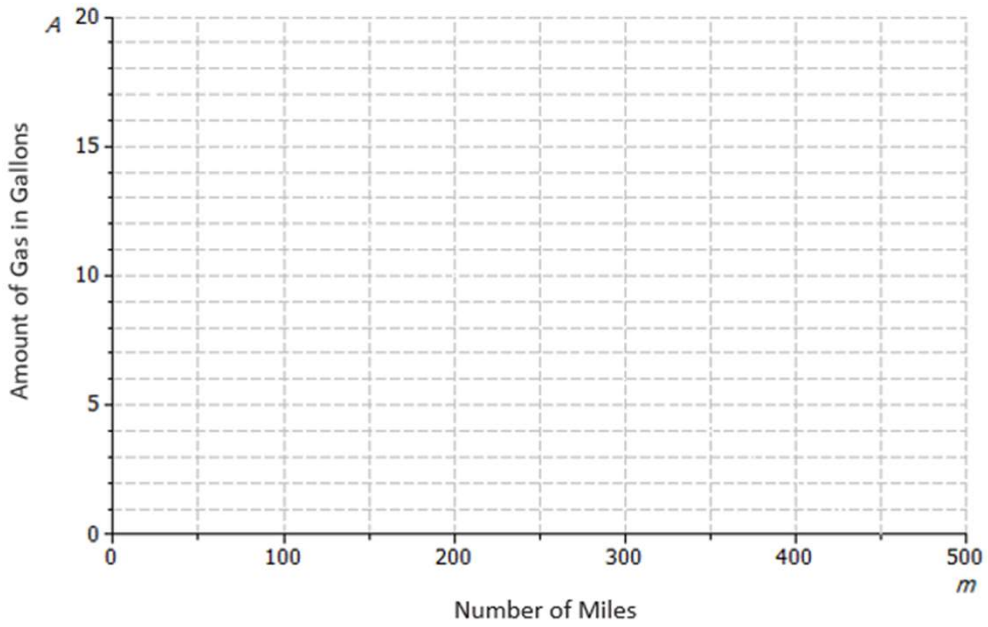
Representations of a Line

1. A car starts a journey with 18 gallons of fuel. Assuming a constant rate, the car consumes 0.04 gallon for every mile driven. Let A represent the amount of gas in the tank (in gallons) and m represent the number of miles driven.



a) How much gas is in the tank if 0 miles have been driven? How would this be represented on the axes above?

b) What is the rate of change that relates the amount of gas in the tank to the number of miles driven? Explain what it means within the context of the problem.

c) On the axes above, draw the line that represents the graph of the linear function that relates A to m.

d) Write the linear function that models the relationship between the number of miles driven and the amount of gas in the tank.

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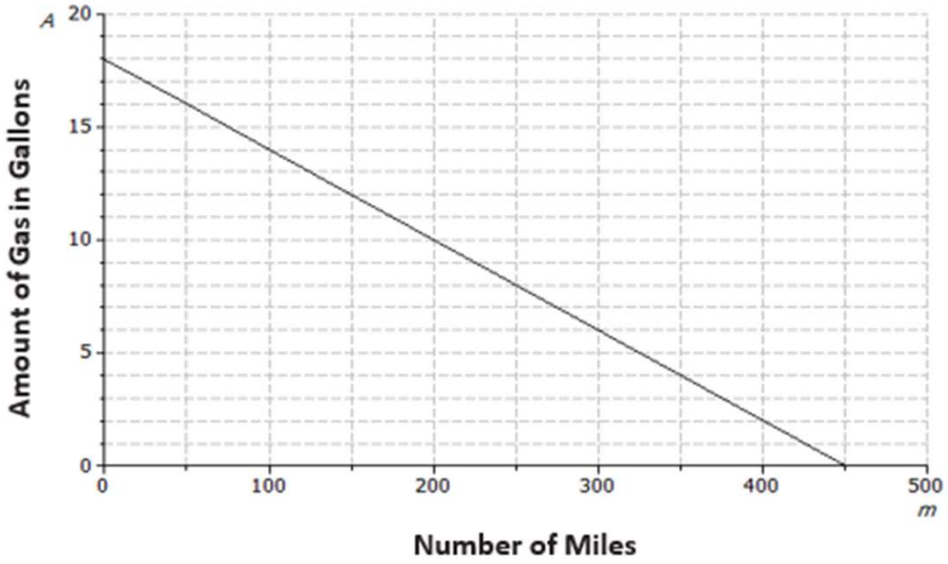

a) How much gas is in the tank if 0 miles have been driven? How would this be represented on the axes above?

There are 18 gallons in the tank. This would be represented as $(0, 18)$, the initial value, on the graph above.

b) What is the rate of change that relates the amount of gas in the tank to the number of miles driven? Explain what it means within the context of the problem.

-0.04; the car consumes 0.04 gallon for every mile driven. It relates the amount of fuel to the miles driven.

c) On the axes above, draw the line that represents the graph of the linear function that relates A to m.

See the graph above. Students can plot the initial value $(0, 18)$ and then use the rate of change to identify additional points as needed. A 50-unit increase in m results in a 2-unit decrease for A, so another point on the line is $(50, 16)$.

d) Write the linear function that models the relationship between the number of miles driven and the amount of gas in the tank.

$$A = 18 - 0.04m \text{ or } A = -0.04m + 18$$