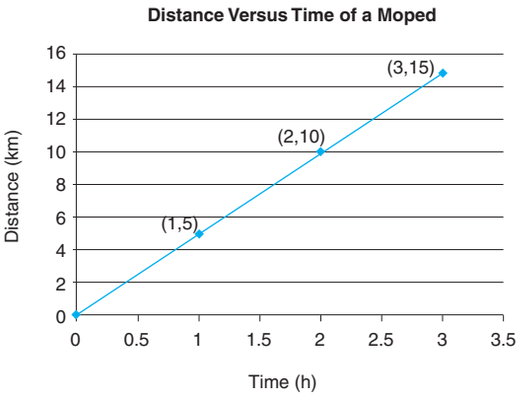
Practice Run



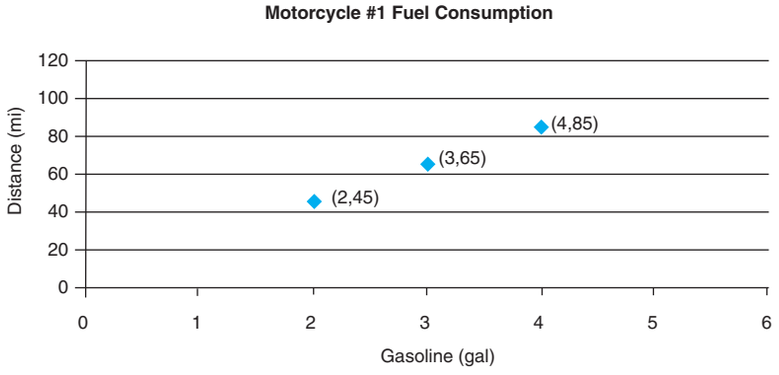
1. a. Using the graph above, calculate the average speed of the moped.

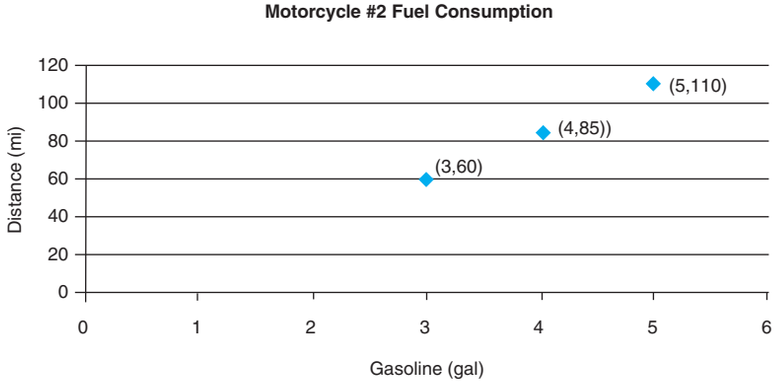
b. Convert the moped's average speed to
   - metres per minute (1 kilometre = 1000 metres)
   - miles per hour (1 mile = 1.6 kilometres)

2. Graphs representing the fuel consumption of two different motorcycles are provided.

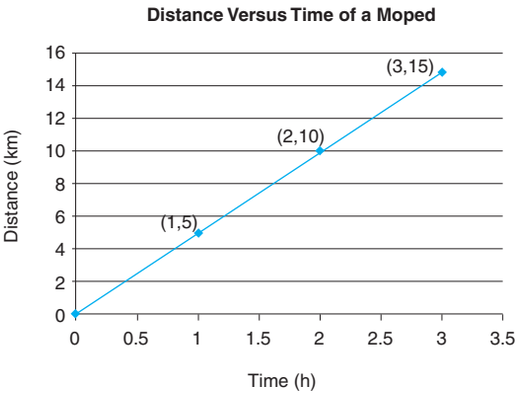
   a. Determine the average fuel consumption of each motorcycle.

   b. Which motorcycle uses less fuel? Explain.





Compare your answers.



1. a. Using the graph above, calculate the average speed of the moped.

$$s = \frac{10\text{ km} - 0\text{ km}}{2\text{ h} - 0\text{ h}}$$
$$s = \frac{10\text{ km}}{2\text{ h}}$$
$$s = 5\text{ km/h}$$

b. Convert the moped's average speed to
- metres per minute (1 kilometre = 1000 metres)
- miles per hour (1 mile = 1.6 kilometres)

In metres per minute:
Let x = distance in metres

$$\frac{5\text{ km}}{x} = \frac{1\text{ km}}{1000\text{ m}}$$
$$5\text{ km} \cdot 1000\text{ m} = 1\text{ km} \cdot x$$
$$5000\text{ m} = x$$

5000 metres per hour

In miles per hour:
Let x = distance in miles

$$\frac{5\text{ km}}{x} = \frac{1.6\text{ km}}{1\text{ mi}}$$
$$5\text{ km} \cdot 1\text{ mi} = 1.6\text{ km} \cdot x$$
$$\frac{5\text{ km} \cdot 1\text{ mi}}{1.6\text{ km}} = \frac{1.6\text{ km} \cdot x}{1.6\text{ km}}$$
$$3.125\text{ mi} = x$$

3.125 miles per hour

Convert hours to minutes.
1 hour = 60 minutes

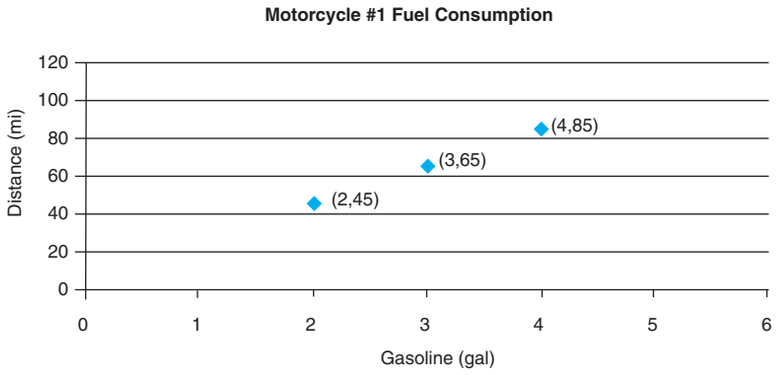
$$\frac{5000\text{ m}}{60\text{ min}} = \frac{x}{1\text{ min}}$$
$$5000\text{ m} \cdot 1\text{ min} = 60\text{ min} \cdot x$$
$$\frac{5000\text{ m} \cdot 1\text{ min}}{60\text{ min}} = \frac{60\text{ min} \cdot x}{60\text{ min}}$$
$$83.333\ldots\text{m} = x$$

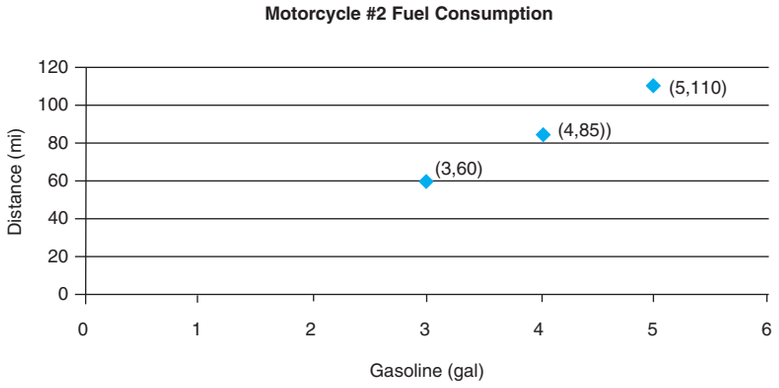
83.3 metres per minute

2. Graphs representing the fuel consumption of two different motorcycles are provided.

   a. Determine the average fuel consumption of each motorcycle.

   b. Which motorcycle uses less fuel? Explain.





Fuel consumption for #1.	Fuel consumption for #2.
$m = \frac{\text{change in distance}}{\text{change in gallons}}$ $m = \frac{d_2 - d_1}{g_2 - g_1}$ $m = \frac{85 \text{ mi} - 65 \text{ mi}}{4 \text{ gal} - 3 \text{ gal}}$ $m = \frac{20 \text{ mi}}{1 \text{ gal}} = 20 \text{ mi/gal}$ Rate of consumption is 20 mi/gal. For every 20 miles travelled one gallon used.	$m = \frac{\text{change in distance}}{\text{change in gallons}}$ $m = \frac{d_2 - d_1}{g_2 - g_1}$ $m = \frac{110 \text{ mi} - 85 \text{ mi}}{5 \text{ gal} - 4 \text{ gal}}$ $m = \frac{25 \text{ mi}}{1 \text{ gal}} = 25 \text{ mi/gal}$ Rate of consumption is 25 mi/gal. For every 25 miles travelled one gallon used.

Motorcycle #2 uses less fuel because it travels farther using the same amount of fuel.

Understanding rates allows you to make sense of how fast one quantity changes in relation to another. *Lesson 5.2* introduces the application of rates and proportions when working with scale factors and scale diagrams.