

# THE CAR PROBLEM

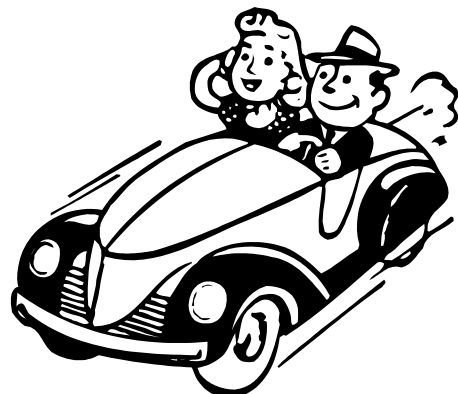
Name \_\_\_\_\_

## Multistep Equations in Context

Suppose the Allmans want to rent a convertible for the day.

They have a choice of two rental companies:

- A one-day rental at **Nifty Car Rental** costs \$30 plus 60 cents per mile.
- A one-day rental at **Shazam Car Rental** costs \$55 but only charges 35 cents per mile.



❶ Make a good data table:

# of miles driven									
<b>Nifty</b>									
Total Cost (\$)									
<b>Shazam</b>									
Total Cost (\$)									

❷ Write a function for each car rental company that expresses the total cost in terms of the number of miles driven. (Use  $C$  for cost and  $m$  for miles.)

**Nifty Car Rental**

**Shazam Car Rental**

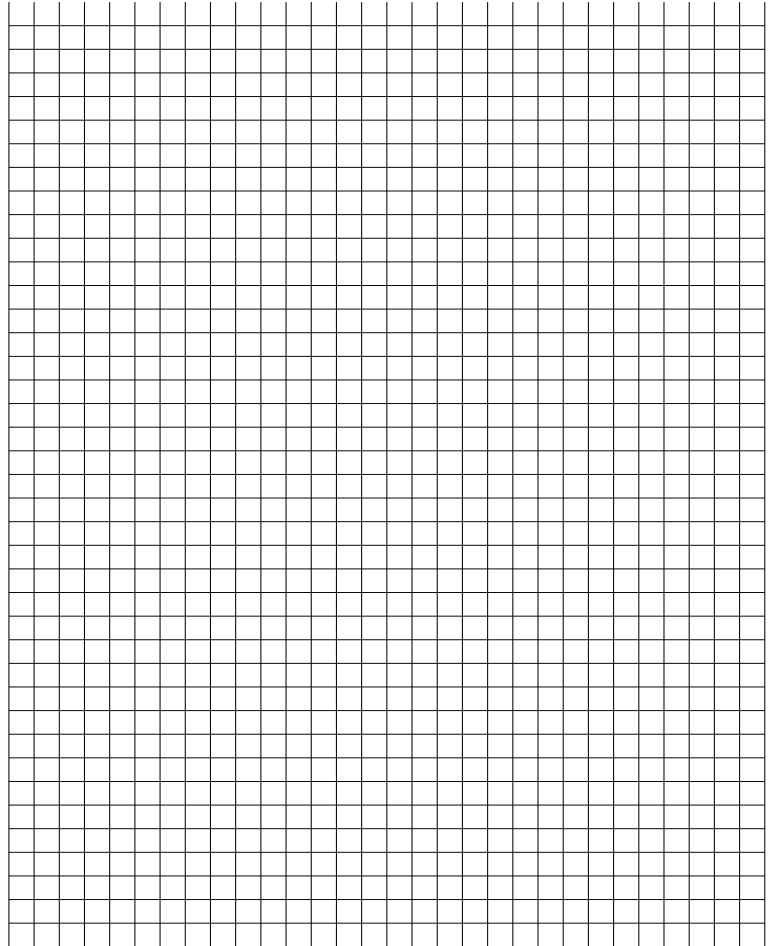
❸ If the Allmans drive 225 miles, which company would be a better deal? Explain.

❹ If the Allmans only have \$80 to spend, which company would be a better deal? Explain.

- 5 Use your functions and tables to make your best possible comparison graph that represents the costs for both companies.



### Nifty vs Shazam Car Rental Comparisons



- 6 At what number of miles will the two companies cost the same? \_\_\_\_\_

Circle the place on the graph that verifies this.

Then use your functions to **prove your solution** with an algebraic method.

- 7 Which car rental company should the Allmans choose and why?

# THE CAR PROBLEM

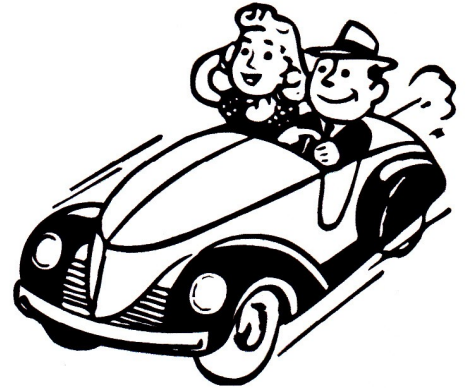
Name Teacher's Key

## Multistep Equations in Context

Suppose the Allmans want to rent a convertible for the day.

They have a choice of two rental companies:

- A one-day rental at **Nifty Car Rental** costs \$30 plus 60 cents per mile.
- A one-day rental at **Shazam Car Rental** costs \$55 but only charges 35 cents per mile.



① Make a good data table: *Think about domain when setting up a table and try to ensure a wide spread*

# of miles driven	0	20	40	60	80	100	200	300	400
<b>Nifty</b>									
Total Cost (\$)	30	42	54	66	78	90	150	210	270
<b>Shazam</b>									
Total Cost (\$)	55	62	69	76	83	90	125	160	195

② Write a function for each car rental company that expresses the total cost in terms of the number of miles driven. (Use  $C$  for cost and  $m$  for miles.)

### Nifty Car Rental

$$C = 30 + 0.60m$$

### Shazam Car Rental

$$C = 55 + 0.35m$$

③ If the Allmans drive 225 miles, which company would be a better deal? Explain.

Nifty

$$C = 30 + 0.60(225)$$

$$C = \$165$$

Shazam

$$C = 55 + 0.35(225)$$

$$C = \$133.75$$

Shazam is cheaper

④ If the Allmans only have \$80 to spend, which company would be a better deal? Explain.

Nifty

$$80 = 30 + 0.60m$$

$$m = 83\frac{1}{3} \text{ miles}$$

Shazam

$$80 = 55 + 0.35m$$

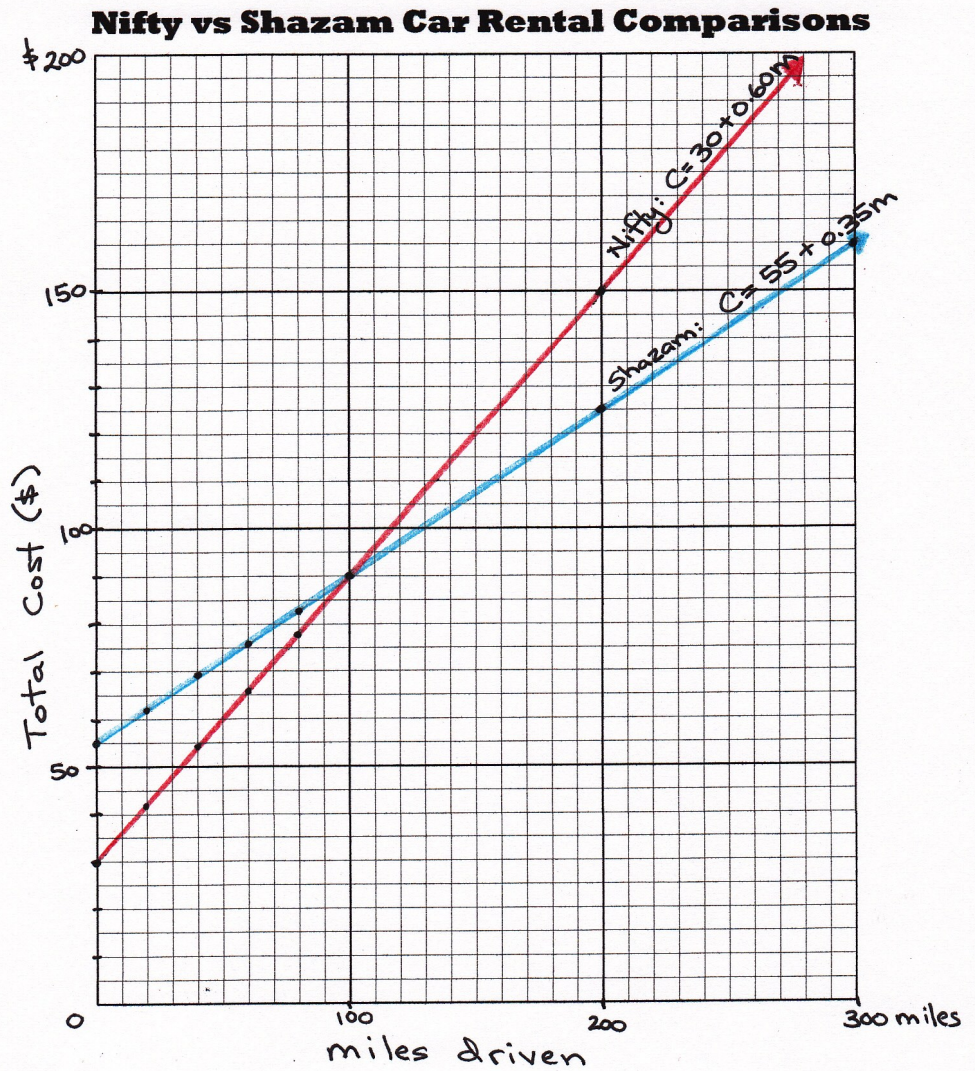
$$m = 71\frac{3}{7} \text{ miles}$$

Nifty allows more miles for \$80

5 Use your functions and tables to make your best possible comparison graph that represents the costs for both companies.



— Nifty  
— Shazam



6 At what number of miles will the two companies cost the same? 100 miles

Circle the place on the graph that verifies this. When will Nifty's Cost = Shazam's Cost?  
Then use your functions to **prove your solution** with an algebraic method.

$$\text{When: } \begin{array}{cccc} 30 + .6m & = & 55 + .35m \\ -30 & - .35m & -30 & - .35m \end{array}$$

$$\frac{0.25m}{0.25} = \frac{25}{0.25}$$

$$m = 100 \text{ miles !}$$

7 Which car rental company should the Allman's choose and why?

Unless they plan on staying around town, I would say Shazam is a better bet. Even if they end up driving a little less than 100 miles, they only stand to lose a few bucks... but if they choose Nifty and go over 100 miles they could spend a lot more in the end.