

## Identifying Proportional and Nonproportional Relationships

1. You have been hired by your neighbors to babysit their children on Friday night. You are paid \$8 per hour. Complete the table relating your pay to the number of hours you worked.

| Hours worked | Pay |
|--------------|-----|
| 1            | 8   |
| 2            | 16  |
| 3            | 24  |
| 4            | 32  |
| 4.5          | 36  |
| 5            | 40  |
| 6            | 48  |
| 6.5          | 52  |

Based on the table above, is pay proportional to hours worked? How do you know?

Yes, it is proportional. It has a constant ratio of \$8/hr

2. The table below represents the amount of snow fall in 5 counties (in inches) to hours of a recent winter storm. Determine if  $y$  is proportional to  $x$ . Justify your answer.

| $x$<br>Time (hrs.) | $y$<br>Snowfall (in.) |
|--------------------|-----------------------|
| 2                  | 10                    |
| 6                  | 12                    |
| 8                  | 16                    |
| 2.5                | 5                     |
| 7                  | 14                    |

$$\frac{10}{2} = 5$$

$$\frac{12}{6} = 2$$

$$\frac{16}{8} = 2$$

$$\frac{5}{2.5} = 2$$

$$\frac{14}{7} = 2$$

$y$  isn't proportional to  $x$   
there isn't a constant ratio  
They have different unit rates.

3. Laycee is planning to drive from New Jersey to Florida. Laycee recorded the distance traveled and the total number of gallons used every time she stopped for gas. Assume miles driven is proportional to gallons used in order to complete the table.

|              |    |     |     |     |     |     |
|--------------|----|-----|-----|-----|-----|-----|
| Gallons used | 2  | 4   | 7   | 8   | 10  | 12  |
| Miles Driven | 54 | 108 | 189 | 216 | 270 | 324 |

$$\frac{54}{2} = 27 \text{ mpg}$$

4. In each table below determine if  $y$  is proportional to  $x$ . Explain why or why not.

a) *yes-proportional*

| $x$ | $y$ |                    |
|-----|-----|--------------------|
| 3   | 12  | $\frac{12}{3} = 4$ |
| 5   | 20  | $\frac{20}{5} = 4$ |
| 2   | 8   | $\frac{8}{2} = 4$  |
| 8   | 32  | $\frac{32}{8} = 4$ |

*same unit rate*

b) *no-not proportional*

| $x$ | $y$ |                       |
|-----|-----|-----------------------|
| 3   | 15  | $\frac{15}{3} = 5$    |
| 4   | 17  | $\frac{17}{4} = 4.25$ |
| 5   | 19  | $\frac{19}{5} = 3.8$  |
| 6   | 21  | $\frac{21}{6} = 3.5$  |

*different unit rates*

c) *yes-proportional*

| $x$ | $y$ |                              |
|-----|-----|------------------------------|
| 6   | 4   | $\frac{4}{6} = \frac{2}{3}$  |
| 9   | 6   | $\frac{6}{9} = \frac{2}{3}$  |
| 12  | 8   | $\frac{8}{12} = \frac{2}{3}$ |
| 3   | 2   | $\frac{2}{3}$                |

*all have the same unit rate*

5. The table shows the relationship between the number of parents in a household and the number of children in the same household. Is the number of children proportional to the number of parents in the household? Explain why or why not.

| Number of Parents | Number of Children |
|-------------------|--------------------|
| 0                 | 0                  |
| 1                 | 3                  |
| 1                 | 5                  |
| 2                 | 4                  |
| 2                 | 1                  |

*The number of children to parents is not proportional. There isn't a constant ratio. Unit rates are different.*

$\frac{3}{1} = 3$   
 $\frac{5}{1} = 5$   
 $\frac{4}{2} = 2$   
 $\frac{1}{2}$