

Name: Key

Date:

Topic:

Class:

**Main Ideas/Questions**  
**PROPORTIONAL vs. NONPROPORTIONAL Relationships**

**Notes/Examples**

- If the ratios or rates of two quantities are equal then the quantities are proportional.
- If the ratios or rates of two quantities are not equal then the quantities are nonproportional.

**EXAMPLE**

Erik and Lucy ran 20 minutes each on the treadmill at the gym. The table below shows the number of calories each has burned after 5 minute intervals. Complete each table and determine the type of relationship.

Erik		
Time	Calories	Rate
5	70	14
10	140	14
15	210	14
20	280	14

Lucy		
Time	Calories	Rate
5	45	9
10	90	9
15	120	8
20	180	9

- ▶ The calories burned by Erik is proportional to the time because the rates are all 14 cals/min.
- ▶ The calories burned by Lucy is nonproportional to the time because the rates are not equal.

**MORE PRACTICE**

**Directions:** Determine whether the quantities in each table represent a proportional relationship. If yes, give the constant rate.

1.

Number of Buses	1	2	3	4
Number of Students	24	45	78	100

24    22.5    26    25

Nonproportional

2.

Hours Worked	4	8	10	15
Money Earned (\$)	36	72	90	135

9    9    9    9

Proportional  
r = \$9/hr

3.

Movie Tickets Sold	25	38	42	64
Revenue (\$)	175	260	300	440

7 6.8 7.1 6.9

Nonproportional

4.

Gallons of Gas Used	1	2	3	4
Miles Driven	21	42	63	84

21 21 21 21

Proportional  
 $r = 21 \text{ mpg}$

5.

Number of Candy Bars	5	10	20	35
Cost (\$)	4	8	16	28

0.80 0.80 0.80 0.80

Proportional  
 $r = \$0.80/\text{bar}$

6.

Number of Songs	3	4	5	6
Total Time (min)	12	15	21	24

4 3.75 4.2 4

Nonproportional

### COMPLETING TABLES

Directions: If the following tables represent a proportional relationship, complete the table.

7. Ben earns \$8.50 per hour bagging groceries at the grocery store.

Hours	4	8	10	14
Money Earned (\$)	\$34	\$68	\$80.50	\$119

8. The wide receiver can run 9 yards per second.

Seconds	1	3	6	10
Yards	9	27	54	90

9. Mitch pays \$0.30 per minute on a long distance phone call.

Minutes	5	12	24	30
Cost (\$)	\$1.50	\$3.60	\$7.20	\$9.00

10. The real estate office sells 7 homes per month. Complete the chart, then determine how many homes they sell in two years.

Months	2	5	8	10
Homes Sold	14	35	56	70

168 homes in 2 years