Chapter 1 Ratios and Proportional Reasoning

Lesson 1-4 Proportional and Nonproportional Relationships
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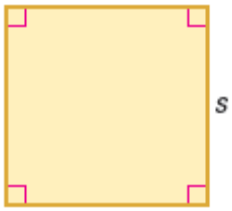
1 **An adult elephant drinks about 225 liters of water each day. Is the number of days the water supply lasts proportional to the number of liters of water the elephants drinks?**

Make a table and compare the values.

Time (days)	1	2	3	4
Water (L)	225	450	675	900

The time to water ratio for 1, 2, 3, and 4 days is $\frac{1}{225}$, $\frac{2}{450}$ or $\frac{1}{225}$, $\frac{3}{675}$ or $\frac{1}{225}$, and $\frac{4}{900}$ or $\frac{1}{225}$. Since these ratios are all equal to $\frac{1}{225}$, the number of days the supply lasts is proportional to the amount of water the elephant drinks.

5 **Determine whether the measures for the figure shown are proportional.**



a. Make a table and compare the side length to the perimeter.

Side length (units)	1	2	3	4
Perimeter (units)	4	8	12	16

The side length to perimeter ratio for side lengths of 1, 2, 3, and 4 units is $\frac{1}{4}$, $\frac{2}{8}$ or $\frac{1}{4}$, $\frac{3}{12}$ or $\frac{1}{4}$, and $\frac{4}{16}$ or $\frac{1}{4}$. Since these ratios are all equal to $\frac{1}{4}$, the measure of the perimeter of a square is proportional to its side length.

b. Make a table and compare the side length to the area.

Side length (units)	1	2	3	4
Area (units^2)	1	4	9	16

The side length to area ratio for side lengths of 1, 2, 3, and 4 units is $\frac{1}{1}$ or 1, $\frac{2}{4}$ or $\frac{1}{2}$, $\frac{3}{9}$ or $\frac{1}{3}$, and $\frac{4}{16}$ or $\frac{1}{4}$.

Since these ratios are not all equal, the measure of the area of a square is not proportional to its side length.