name:

1. For each of these pairs, find the appropriate length scale factors, and use them to decide if the shapes are similar (proportional) or not:

a. b.



8 cm wide 6 cm wide

3 cm high 2 cm high

4 cm wide 6 cm wide

5 cm high 7.5 cm high

c. Two images of a leaf: d. Two images of a banana:

smaller: larger: larger: smaller:

6 cm wide 8 cm wide 9 cm wide 6 cm wide

2 cm high 4 cm high 6.6 cm high 4.4 cm high

2. Each of these pairs is proportional. Find the scale factor(s) and use it to find the missing lengths and area.

a. b.

scale factor: scale factor:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | original | new |  |  | original | new |
| width flag | 4 cm | 9 cm |  | width paper | 18 cm |  |
| height flag |  | 6 cm |  | height paper | 27 cm | 18 cm |
| width dragon | 2.6 cm |  |  | length pencil |  | 14 cm |
| area dragon | 2 cm2 |  |  | area pencil | 30 cm2 |  |

3. Investigate rectangles and other shapes with the same area but different perimeters.

Optional: cut out square units from the grid on the next page, or draw your shapes on the grid on the following page.

a. Take 12 square units and make several different shapes that all have area 12 square units. At a minimum. List or draw all of your shapes here. At a minimum, you should include all three of the rectangles with whole number side lengths that have an area of 12 square units (rectangles you could make from 12 squares without cutting any squares in half). Find and tell the perimeter of each shape:

b. Take 16 square units and make several different shapes that all have area 16 square units. At a minimum. List or draw all of your shapes here. At a minimum, you should include all three of the rectangles with whole number side lengths that have an area of 16 square units (rectangles you could make from 16 squares without cutting any squares in half). Find and tell the perimeter of each shape:

c. Describe patterns in the shapes: of all of the shapes that have the same area, which sorts of shapes will have the shortest perimeter? Which sorts of shapes will have the longest perimeter?

