Scale factor and area problems name:_____

Note: Your default assumption should be that shapes are proportional (similar) unless there is information to tell you that they are not proportional (similar).

1. I drew two pictures of a school. If the larger picture is twice as wide and 3 times as high as the smaller picture, by what factor has the area increased? 	Are the pictures similar? What is the area ratio Large:Small?
2. I have two pictures of a star. The smaller star has an area of 5 cm^2. If the larger star is 3 times as wide and 4 times as high as the smaller star, what is its area?	Are the pictures similar? What is the area of the larger star?
3. I have two pictures of a tree. The smaller picture was made from the larger picture by compressing by a scale factor of 1/2 vertically, and 1/2 horizontally. If the smaller picture has an area of 6 cm^2, what is the area of the larger tree?	Are the pictures similar? What is the area of the larger tree?
4. I have two similar (proportional) pictures of a moon and star. The larger picture was enlarged by 200% on a standard copy machine from the smaller one: c. If the area of the *smaller* star is 5 cm^2, what is the area of the *larger* star? d. If the area of the *larger* moon is 48 cm^2, what is the area of the *smaller* moon? 	a. What the length ratio large:small? b. What is the area ratio large:small? c. d.
5. I have a picture in an art book showing the famous painting the Mona Lisa. My picture is 1/5 as wide as the original painting. If my picture is 24 in^2, what is the area of the original painting?	a. Is it reasonable to assume that the pictures are similar? b. What the length ratio large:small? c. What is the area ratio large:small? d. What is the area of the larger painting

12. John painted a Santa that was 10 inches high, and it used 1/2 oz of paint. Then he was asked to paint another (similar/proportional) santa that is 30 inches high. How much paint will he use for the larger Santa?

13. Jack climbed up the beanstalk, and went into the giant's house. The giant's height is 4x Jack's height. If everything in the giant's house is proportional to things in Jack's house, answer the following questions:

a. If Jack's table top is 8 square feet, what is the area of the giant's table top?

b. If the circumference of Jack's plate is 2 ft, what is the circumference of the giant's plate?

c. If Jack's mug holds 1 cup of water, how much water can the giant's mug hold?

d. If Jack weighs 100 lbs, how much does the giant weigh (assume Jack and the giant are also similar in shape)?