Word problems with scaling similar objects.

1. I have two similar/proportional pictures of a cake. If the smaller cake has area 8 cm2, and the area of the large cake is 72cm2, what is the (length) scale factor that compares the large one to the small one.

2. John painted a Santa that was 10 inches high, and it used 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?

3. 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, how big is 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?

e. Jack is 5’10” tall. How tall is the Giant?

f. It takes 2 yards of 36” width fabric (which is 2 square yards) to make a shirt for Jack. How much fabric would you need to make a shirt for the Giant?

g. It takes 9 ounces of paint to paint Jack’s front door. How much paint would it take to paint the Giant’s front door?

4. Jan built a 1/50 scale model of the new library before it was built.

a. If the length along one side of the scale model is 3 feet, what is the length of the corresponding side of the library?

b. If Jan used 2 square feet of glass for the windows in the model, how many square feet of glass will the library have?

Answers

1. I have two similar/proportional pictures of a cake. If the smaller cake has area 8 cm2, and the area of the large cake is 72cm2, what is the (length) scale factor that compares the large one to the small one.

8 x 9 = 72

length scale factor is x 3.

2. John painted a Santa that was 10 inches high, and it used 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?

length scale factor = 3

paint scales by area so 2 oz x 9 = 18 oz.

3. 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, how big is the giant’s table top?

8 x 4 x 4 = 128 square feet

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

2 x 4 = 8 ft

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

1 x 4 x 4 x 4 = 64 cups

d. If Jack weighs 100 lbs, how much does the giant weigh?

100 x 4 x 4 x 4 = 6400 lbs

e. Jack is 5’10” tall. How tall is the Giant?

5’10”x4=20’40”=23’4”

f. It takes 2 yards of 36” width fabric (which is 2 square yards) to make a shirt for Jack. How much fabric would you need to make a shirt for the Giant?

2x4x4=32 square yards = 32 yards of 1 yard wide fabric or 8 yards of 4 yard wide fabric.

g. It takes 9 ounces of paint to paint Jack’s front door. How much paint would it take to paint the Giant’s front door?

9x4x4=144 ounces (paint is used by the square foot, so it scales by area)

4. Jan built a 1/50 scale model of the new library before it was built.

a. If the length along one side of the scale model is 3 feet, what is the length of the corresponding side of the library?

3x50=150 feet

b. If Jan used 2 square feet of glass for the windows in the model, how many square feet of glass will the library have?

2x50x50=5000 square feet