Name: Key Period: _____ Date: _____

Math 7 **Chapter 11** **Pre-Test**

1. A model of the DC-10 airplane has a scale of $\frac{1}{144}$.

   Answer each question ~~and explain how you~~ show how you calculated your answers.

   a. If the wingspan of the model is 13.75 inches long, how long is the wingspan of the actual plane? Show your proportion and work.

   $\frac{\text{model}}{\text{actual}} = \frac{1}{144} = \frac{13.75 \text{ in}}{1980 \text{ in}}$ (×13.75)

   1980 in ÷ 12 in = 165 feet = 1980 in

   b. If the DC-10 is 58 feet high, how high is the model? Show your proportion and work.

   $\frac{m}{a} = \frac{1}{144} = \frac{x}{58 \text{ feet}}$ (÷144)

   0.403 feet = 4.83 in.

2. The Haitian flag has a width : length ratio of 3 : 5. If a Haitian flag is 180 centimeters long, what is its width in meters? Show your proportion and work.

   $\frac{w}{l} = \frac{3}{5} = \frac{w}{180 \text{ cm}}$ (×36)

   108 cm = 1.08 m

3. The scale factor for a toy animal is 1 : 30. What does this mean?

   The toy is $\frac{1}{30}$ the size of the actual animal. The actual animal is 30 times the size of the toy, proportionately

4. Darius designed a billboard. The billboard is 480 inches long by 144 inches high. Darius used a computer to design the billboard. Determine the following possible sizes for his computer design that maintain exactly the same shape. Show your proportions and work.

   a. $\frac{12 \text{ inches} \times 3.6}{480 \text{ in} \times 144 \text{ in}}$ inches (÷40)

   b. $\frac{8 \text{ inches} \times 2.4 \text{ inches}}{480 \text{ in} \times 144 \text{ in}}$ (÷60)

   c. $\frac{2 \text{ feet} \times 0.6 \text{ feet}}{480 \text{ in} \times 144 \text{ in}}$ (÷20)

   $\frac{2 \text{ feet} \times 0.6 \text{ feet}}{40 \text{ feet} \times 12 \text{ feet}}$ (÷20)

5. J.P. lives 175 miles from his grandmother's house. His map shows that $\frac{1}{4}$ inch is equivalent to 10 miles. How many inches apart are J.P.'s house and his grandmother's house on his map? Hint: Convert the fraction to a decimal. Show your proportion and work.

$\frac{m}{a} = \frac{0.25\text{ in}}{10\text{ mi}} = \frac{4.375\text{ in}}{175\text{ mi}}$ (×17.5)

6. A blueprint has a scale of $\frac{1}{4}$ inch is equivalent to 1 foot. The blueprint shows the design of a room that is $4\frac{1}{2}$ inches long and $3\frac{1}{4}$ inches wide. What are the actual dimensions of the room?

Show your proportion(s) and work.

$\frac{m}{a} = \frac{0.25\text{ in}}{1\text{ foot}} = \frac{4.5\text{ in.}}{l}$ (÷0.25)

18 feet long

$\frac{m}{a} = \frac{0.25\text{ in}}{1\text{ foot}} = \frac{3.25\text{ in}}{w}$ (÷0.25)

13 feet wide

18' x 13'

7. Sara is working with a microscope that magnifies objects to 170 times their actual size.

a. What is the scale factor for the microscope?

$\frac{\text{microscope}}{\text{actual}} = \frac{170}{1}$

b. The diameter of a Staphylococcus bacterium is 0.001 millimeter. How big in will the cell appear to Sara under the microscope? Show your proportion and work.

$\frac{m}{a} = \frac{170}{1} = \frac{0.17\text{ mm}}{0.001\text{ mm}}$ (×0.001)

c. The diameter of an orchid seed under Sara's microscope appears to be 8.5 millimeters. What is the diameter of the actual orchid seed? Show your proportion and work.

$\frac{m}{a} = \frac{170}{1} = \frac{8.5\text{ mm}}{a}$ (÷170)

0.05 mm