

7th Grade Test Review: Measurement Conversion, Similar Figures & Scale Factor

Directions: Show your work for each problem.

Conversions between Systems of Measure

When converting from Customary to Metric, use these approximations.

- | | |
|---------------------------|--------------------------|
| 1 inch = 2.54 centimeters | 1 cup = 0.24 liter |
| 1 foot = 0.305 meter | 1 gallon = 3.785 liters |
| 1 mile = 1.61 kilometers | 1 ounce = 28.35 grams |
| | 1 pound = 0.454 kilogram |

When converting from Metric to Customary, use these approximations.

- | | |
|--------------------------|---------------------------|
| 1 centimeter = 0.39 inch | 1 liter = 4.23 cups |
| 1 meter = 3.28 feet | 1 liter = 0.264 gallon |
| 1 kilometer = 0.62 mile | 1 gram = 0.0352 ounce |
| | 1 kilogram = 2.204 pounds |

1. How many inches are in a foot? How many feet are in a yard? How many inches are in a yard?

1 foot = 12 inches
 1 yard = 3 feet
 1 yard = 36 inches

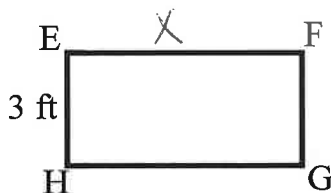
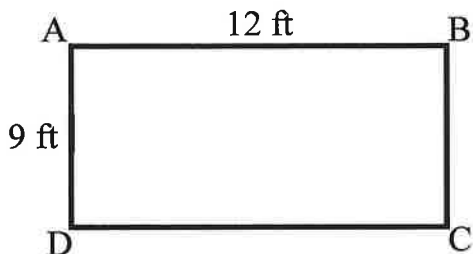
2. Usain Bolt holds the record in the 100-meter dash. How many feet is the race?

1 meter = 3.28 feet
 $3.28 \times 100 = 328 \text{ feet}$

3. Brad can bench press 98 kilograms. How many pounds can he bench press?

1 kilogram = 2.204 pounds
 $2.204 \times 98 = 215.992 \text{ pounds}$

4. Rectangle ABCD is similar to rectangle EFGH.



$\frac{12}{9} = \frac{x}{3}$
 $9x = 36$
 $x = 4$

What is the length of \overline{EF} ?

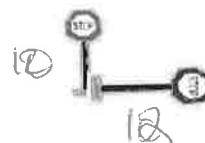
4 feet

5. A palm tree casts a shadow that is 42 feet long. A 10 foot sign casts a shadow that is 12 feet long. How tall is the palm tree?

$\frac{x}{42} = \frac{10}{12}$

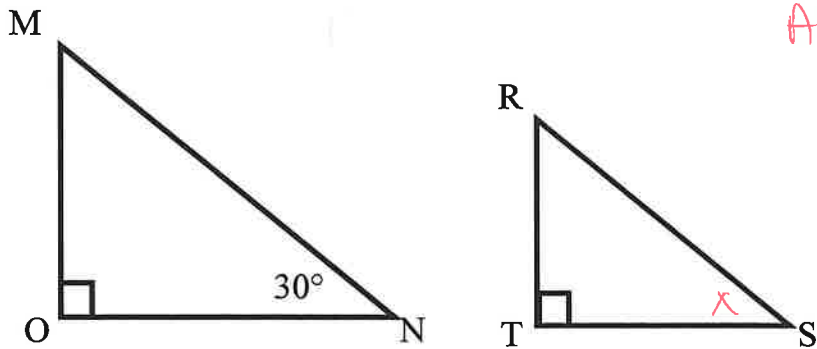
$12x = 420$

$x = 35 \text{ ft}$



6. Triangle MNO is similar to triangle RST.

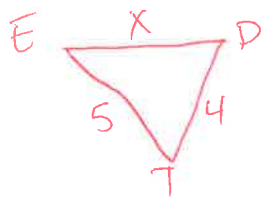
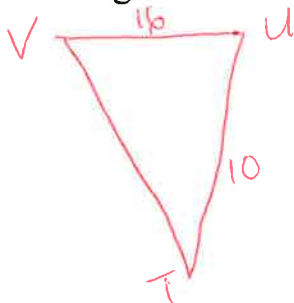
CORRESPONDING ANGLES ARE CONGRUENT



What is the measurement of angle S?

30°

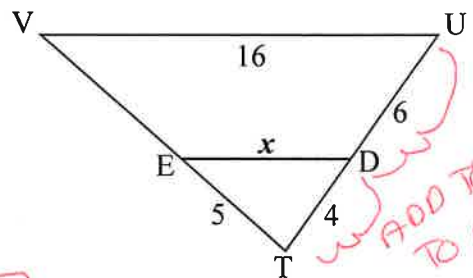
7. If triangles TUV and TDE shown in the figure to the right are similar, what is the value of x?



$$\frac{16}{10} = \frac{x}{4}$$

$$10x = 64$$

$$x = 6.4$$



ADD TOGETHER TO GET 10

8. A four-foot-tall person is standing next to a statue. The person is casting a shadow $2\frac{1}{2}$ feet in length, while the statue is casting a shadow 9 feet in length. How tall is the statue?

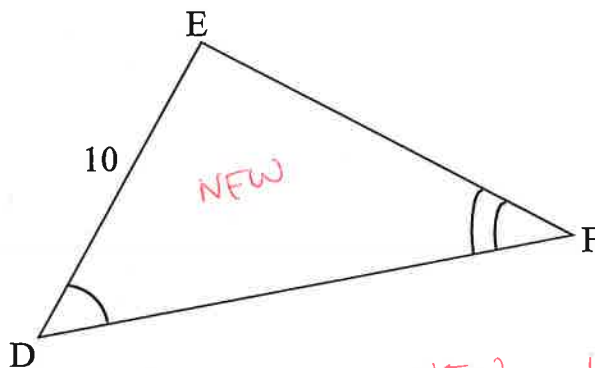
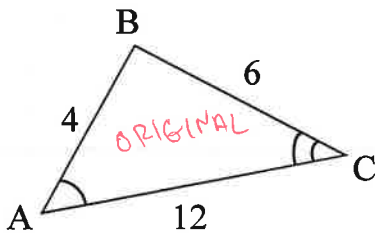


$$\frac{x}{9} = \frac{4}{2\frac{1}{2}}$$

$$2.5x = 36$$

$$x = 14.4$$

9. $\triangle ABC$ is similar to $\triangle DEF$.



What is the scale factor from $\triangle ABC$ to $\triangle DEF$?

$$\text{SCALE FACTOR} = \frac{\text{NEW}}{\text{ORIG}} = \frac{10}{4} = 2.5$$

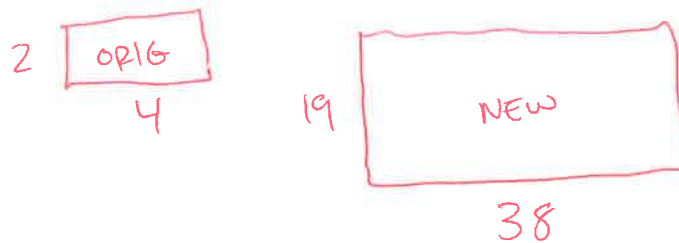
10. Michelle drew a picture that is 11 inches by 14 inches. She wants to enlarge the picture by a scale factor of 4. What are the dimensions of the new picture?

$$\begin{array}{l} \text{SCALE} \\ \text{FACTOR} = 4 \end{array} \quad \begin{array}{l} 11 \text{ by } 14 \\ \times 4 \quad \times 4 \\ \hline 44 \text{ by } 56 \end{array} = \boxed{44 \text{ inches by } 56 \text{ inches}}$$

11. The length of Dexter's train is 36 inches long. He built a scale model of the train with a scale factor of $\frac{1}{6}$. What is the length of the model train?

$$36 \cdot \frac{1}{6} = \frac{36}{1} \cdot \frac{1}{6} = \frac{36}{6} = \boxed{6}$$

12. Ben has a small recycle bin by his desk that is 2 feet by 4 feet. There is a similar recycle bin outside that is 19 feet by 38 feet. What is the scale factor from the small recycle bin to the outside recycle bin?



$$\begin{array}{l} \text{SCALE} \\ \text{FACTOR} \end{array} = \frac{\text{NEW}}{\text{ORIG}} = \frac{19}{2} = \boxed{9.5}$$