

Homework: Dimensional Analysis

MCC9-12.N.Q.1 Use units as a way to understand problems and guide the solution of multi-step problems; choose and interpret the scale and the origin in graphs and data displays.

1. Six items purchased at a grocery store weighs 14000 grams. How much do the groceries weigh in pounds?

$$14,000 \text{ g} \cdot \frac{1 \text{ lb}}{454 \text{ g}} = \boxed{30.84 \text{ lb}}$$

2. A football field is exactly 120 yards long. How long is the field in meters?

$$120 \text{ yd} \cdot \frac{0.914 \text{ m}}{1 \text{ yd}} = \boxed{109.68 \text{ m}}$$

3. The distance from Augusta to Charleston is 143.3 miles (via US-78). Express this distance in kilometers.

$$143.3 \text{ mi} \cdot \frac{1.61 \text{ km}}{1 \text{ mi}} = \boxed{230.7 \text{ km}}$$

4. Assume that one dollar is equal to 0.8135 euro. If an item sells for 25 euro, what is the approximate cost in dollars?

$$\text{€ } 25 \cdot \frac{\$ 1}{\text{€ } 0.8135} = \boxed{\$ 30.73}$$

5. Suppose a 60 inch man stands on the head of a 6 foot man. How tall are they together?

$$60 \text{ in} \cdot \frac{1 \text{ ft}}{12 \text{ in}} = 5 \text{ ft.} \quad 6 + 5 = \boxed{11 \text{ ft}}$$

6. The longest runway at Chicago's O'Hare International Airport is 13,001 ft long. The longest runway at New York's JFK International Airport is 2.76 miles long. Which runway is longer? Justify your answer.

$$13,001 \text{ ft} \cdot \frac{1 \text{ mi}}{5,280 \text{ ft}} = \boxed{2.46 \text{ mi}}$$

$$2.76 \text{ mi} > 2.46 \text{ mi}$$

∴ the longer runway is at JFK airport.