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Course: MA097_Fa20_Datuin
Assignment: Section A.4 Homework

1. Make approximate conversion from metric to U.S. customary or U.S. customary to metric.

16 m to yards

16 m = 17.4 yd (Round to the nearest tenth as needed.)

2. Make an approximate conversion from metric to US units.

8 km to miles

To convert from km to miles, first choose the appropriate conversion fact below.

- **A.** 1 km ≈ 1.61 miles
- **B.** 1 km ≈ 0.62 miles
- **C.** 1 mile ≈ 0.62 km
- **D.** 1 km ≈ 1000 miles

Which unit fraction can be used to cancel km?

- $\frac{0.62 \text{ mi}}{1 \text{ km}}$
- $\frac{1 \text{ km}}{0.62 \text{ mi}}$

Multiply by the unit fraction.

$\frac{8 \text{ km}}{1} \cdot \frac{0.62 \text{ mi}}{1 \text{ km}} \approx$ 5 mi
(Round to the nearest tenth.)

Thus, 8 km approximately equals 5.0 miles.

YOU ANSWERED: $\frac{1 \text{ km}}{0.62 \text{ mi}}$

3. Make an approximate conversion from metric to English.

69 m to feet

1 mile ≈ 1.61 kilometers
1 meter ≈ 3.28 feet

69 m ≈ _____ ft
(Round to the nearest tenth.)

4. Make an approximate conversion from English to metric.

7 ft to meters

1 mile ≈ 1.61 kilometers
1 kilometer ≈ 0.62 mile
1 meter ≈ 3.28 feet
1 inch ≈ 2.54 centimeters

7 ft ≈ _____ m. (Round to the nearest tenth as needed.)

5. Make an approximate conversion from metric to English.

197 g to ounces

1 pound ≈ 0.45 kilograms
1 gram ≈ 0.035 ounce
1 gallon ≈ 3.79 liters
1 liter ≈ 1.06 quarts

197 g ≈ _____ oz.
(Round to the nearest tenth.)

6. Make an approximate conversion from English to metric. Round your answer to the nearest tenth.

215 lb to kilograms

1 pound ≈ 0.45 kilograms
1 gram ≈ 0.035 ounce
1 gallon ≈ 3.79 liters
1 liter ≈ 1.06 quarts

215 lb ≈ _____ kg.
(Round to the nearest tenth.)

7. Make an approximate conversion from metric to English. Round your answer to the nearest tenth.

20.3 L to quarts

1 pound ≈ 0.45 kilograms
1 gram ≈ 0.035 ounce
1 gallon ≈ 3.79 liters
1 liter ≈ 1.06 quarts

20.3 L ≈ _____ qt
(Round to the nearest tenth.)

8. A company used 10 g of pure gold to coat a pair of shoes.

How many ounces of gold were used?

1 pound ≈ 0.45 kilograms
1 gram ≈ 0.035 ounce
1 gallon ≈ 3.79 liters
1 liter ≈ 1.06 quarts

The company used about _____ oz of pure gold.
(Round to the nearest tenth.)

9 The heavy duty wash cycle in dishwasher uses 8.5 gal of water. How many liters does it use, to the nearest tenth?

1 pound ≈ 0.45 kilograms
1 gram ≈ 0.035 ounce
1 gallon ≈ 3.79 liters
1 liter ≈ 1.06 quarts

The heavy duty wash cycle in a dishwasher uses _____ L of water.
(Round to the nearest tenth.)

10. A small fish is 0.7 inch long. How many centimeters long is the fish, to the nearest tenth?

1 kilometer ≈ 0.62 mile
1 meter ≈ 3.28 feet
1 mile ≈ 1.61 kilometers
1 inch ≈ 2.54 centimeters

The fish is about _____ cm long. (Round to the nearest tenth.)

11. Choose the most reasonable Celsius temperature for a snowy day.

$13^\circ C$ $24^\circ C$ $-10^\circ C$

Choose the most reasonable Celsius temperature for a snowy day.

- **A.** $-10^\circ C$
- **B.** $24^\circ C$
- **C.** $13^\circ C$

12. Choose the most reasonable Celsius temperature for a high fever.

$25^\circ C$ $40^\circ C$ $110^\circ C$

Choose the most reasonable Celsius temperature for a high fever.

- **A.** $110^\circ C$
- **B.** $40^\circ C$
- **C.** $25^\circ C$

13. Choose the most reasonable Celsius temperature for an oven temperature.

$170^\circ C$ $40^\circ C$ $30^\circ C$

Choose the most reasonable Celsius temperature for an oven temperature.

- **A.** $30^\circ C$
- **B.** $40^\circ C$
- **C.** $170^\circ C$

14. Use the conversion formula and the order of operations to convert Fahrenheit temperatures to Celsius. Round your answer to the nearest degree if necessary.

$73\ ^\circ F$

$73\ ^\circ F =$ _____ $^\circ C$
(Simplify your answer. Round to the nearest degree as needed.)

15. Use the conversion formula and the order of operations to convert Fahrenheit temperatures to Celsius.

73 °F

Which of the following is the appropriate formula for converting from Fahrenheit (F) to Celsius (C)?

○ **A.** $C = \frac{5(F-32)}{9}$

○ **B.** $F = \frac{9 \cdot C}{5} + 32$

Substitute the given value of F into the conversion formula.

$$C = \frac{5(F-32)}{9}$$

$$= \frac{5(\_\_\_\_\_ - 32)}{9}$$ Substitute for F.

(Type a whole number or a fraction.)

To simplify the numerator of the expression, use the order of operations. Which of the following operations should be performed first?

○ Subtraction in the parentheses

○ Multiplication

Perform the operation inside the parentheses.

$$C = \frac{5(73-32)}{9}$$

$$= \frac{5(\_\_\_\_\_)}{9}$$ Subtract.

(Type a whole number or a fraction.)

Multiply in the numerator.

$$C = \frac{5(41)}{9}$$

$$= \frac{\_\_\_\_\_}{9}$$ Simplify.

$$\approx \_\_\_\_\_$$ Divide.

(Round to the nearest degree as needed.)

Thus, 73 °F ≈ 23°C.

16. Convert 194° F to Celsius.

Use the formula $C = \frac{5(F-32)}{9}$.

194° F = _____ ° C.

(Round to the nearest whole number as needed.)

17. Convert to Fahrenheit.

Use the formula $F = \frac{9C}{5} + 32$.

19° C

19° C = _____ $^\circ$ F
(Simplify your answer. Round to the nearest degree as needed.)

18. Use the conversion formula and the order of operations to convert Celsius temperatures to Fahrenheit.

25° C

25° C = _____ $^\circ$ F
(Type a whole number or decimal rounded to the nearest tenth as needed.)

19. **(a)** The tag on a pair of boots states that their comfort range is 22°C to 6°C. Describe the kind of weather the boots would be worn in.
(b) For what Fahrenheit temperatures are the boots designed? Round your final answers to the nearest degree.

(a) Describe the kind of weather the boots would be worn in. Choose the correct answer below.

- ○ Hot summer
- ○ Pleasant weather, above freezing but not hot
- ○ Very cold winter

(b) The boots are designed to be worn in temperatures of _____ $^\circ$F to _____ $^\circ$F.
(Round to the nearest whole numbers. List the terms in the same order as they appear in the original list.)

20. A recent news brief reported on some men who flew a model airplane from one country to another country. Can details of the flight be provided?
The model plane is 8 feet long and weighs 11 pounds. It crossed the ocean from Country A, the flight path took it 1888.2 miles in 38 hours, 23 minutes. It soared at a cruising altitude of 1200 feet. The plane used an engine that carried less than 1.1 gallons of fuel. When it landed in Country B, it had less than 2.1 fluid ounces of fuel left. Complete the conversions to metric. Complete parts (a) to (h).

(a) Find the length of the model plane.

To convert 8 feet into the metric unit, first determine the value of 1 foot.

1 foot $\approx$ _____ meter
(Type a whole number or a decimal.)

Using the above, write a unit fraction that allows to divide out feet. Select the correct choice below.

○ **A.** $\frac{8\text{ ft}}{1} \cdot \frac{1\text{ ft}}{0.30\text{ m}}$

○ **B.** $\frac{8\text{ ft}}{1} \cdot \frac{0.30\text{ m}}{1\text{ ft}}$

Now, divide out feet to find the length of the plane in meters.

$$\frac{8\text{ ft}}{1} \cdot \frac{0.30\text{ m}}{1\text{ ft}} \approx \text{m}$$ _____
(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(b) Find the weight of the plane.

To convert 11 pounds into the metric unit, first determine the value of 1 pound.

1 pound $\approx$ _____ kilogram
(Type a whole number or a decimal.)

Using the above, write a unit fraction that allows to divide out pounds. Select the correct choice below.

○ **A.** $\frac{11\text{ lb}}{1} \cdot \frac{0.45\text{ kg}}{1\text{ lb}}$

○ **B.** $\frac{11\text{ lb}}{1} \cdot \frac{1\text{ lb}}{0.45\text{ kg}}$

Now, divide out pounds to find the weight of the plane.

$$\frac{11\text{ lb}}{1} \cdot \frac{0.45\text{ kg}}{1\text{ lb}} \approx \text{kg}$$ _____
(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(c) Find the length of the flight path.

To convert 1888.2 miles into the metric unit, first determine the value of 1 mile.

1 mile $\approx$ _____ kilometers
(Type a whole number or a decimal.)

Using the above, write a unit fraction that allows to divide out miles. Select the correct choice below.

○ **A.** $\frac{1888.2\text{ mi}}{1} \cdot \frac{1\text{ mi}}{1.61\text{ km}}$

○ **B.** $\frac{1888.2 \text{ mi}}{1} \cdot \frac{1.61 \text{ km}}{1 \text{ mi}}$

Now, divide out miles to find the length of the flight path in kilometers.

$\frac{1888.2 \text{ mi}}{1} \cdot \frac{1.61 \text{ km}}{1 \text{ mi}} \approx$ _____ km

(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(d) Determine the time taken by the flight.

The time taken by the flight is _____ hr _____ min.

(Type whole numbers or decimals.)

(e) Determine the cruising altitude of the flight.

To convert 1200 feet into the metric unit, first recall the value of 1 foot.

1 foot ≈ _____ meter

(Type a whole number or a decimal.)

Using the above, write a unit fraction that allows to divide out feet. Select the correct choice below.

○ **A.** $\frac{1200 \text{ ft}}{1} \cdot \frac{1 \text{ ft}}{0.30 \text{ m}}$

○ **B.** $\frac{1200 \text{ ft}}{1} \cdot \frac{0.30 \text{ m}}{1 \text{ ft}}$

Now, divide out feet to find the cruising altitude of the flight in meters.

$\frac{1200 \text{ ft}}{1} \cdot \frac{0.30 \text{ m}}{1 \text{ ft}} \approx$ _____ m

(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(f) Determine the fuel at the start, in milliliters.

To convert 1.1 gallons into milliliters, first convert gallons into liters and then liters into milliliters. To do so, determine the following.

1 gallon ≈ _____ liters 1liter = _____ milliliters

(Type whole numbers or decimals.)

Using the above, write a unit fraction that allows to divide out gallons and liters. Select the correct choice below.

○ **A.** $\frac{1.1 \text{ gal}}{1} \cdot \frac{1 \text{ gal}}{3.79 \text{ L}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$

○ **B.** $\frac{1.1 \text{ gal}}{1} \cdot \frac{3.79 \text{ L}}{1 \text{ gal}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$

○ **C.** $\frac{1.1 \text{ gal}}{1} \cdot \frac{0.95 \text{ L}}{1 \text{ gal}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$

○ **D.** $\frac{1.1 \text{ gal}}{1} \cdot \frac{1 \text{ gal}}{0.95 \text{ L}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$

Now, divide out common units to find the fuel at the start, in milliliters.

$\frac{1.1 \text{ gal}}{1} \cdot \frac{3.79 \text{ L}}{1 \text{ gal}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} \approx$ _____ mL

(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(g) Determine the fuel left after landing, in milliliters.

To convert 2.1 fl oz to milliliters, first convert fl oz to quarts, quarts to liters, and then liters to milliliters. To do so, determine the following.

1 quarts = _____ fluid ounces 1 quarts ≈ _____ liters 1 liter = _____ milliliters

(Type whole numbers or decimals.)

Using the above, write a unit fraction that allows to divide out fluid ounces, quarts and liters. Select the correct choice below.

- **A.** $\frac{2.1 \text{ fl oz}}{1} \cdot \frac{1 \text{ qt}}{32 \text{ fl oz}} \cdot \frac{1 \text{ qt}}{0.95 \text{ L}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$
- **B.** $\frac{2.1 \text{ fl oz}}{1} \cdot \frac{32 \text{ fl oz}}{1 \text{ qt}} \cdot \frac{0.95 \text{ L}}{1 \text{ qt}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$
- **C.** $\frac{2.1 \text{ fl oz}}{1} \cdot \frac{32 \text{ fl oz}}{1 \text{ qt}} \cdot \frac{1 \text{ qt}}{0.95 \text{ L}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$
- **D.** $\frac{2.1 \text{ fl oz}}{1} \cdot \frac{1 \text{ qt}}{32 \text{ fl oz}} \cdot \frac{0.95 \text{ L}}{1 \text{ qt}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}}$

Now, divide out common units to find the fuel left, in milliliters.

$$\frac{2.1 \text{ fl oz}}{1} \cdot \frac{1 \text{ qt}}{32 \text{ fl oz}} \cdot \frac{0.95 \text{ L}}{1 \text{ qt}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} \approx \_\_\_\_\_ \text{ mL}$$

(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(h) What percent of the fuel was left at the end of the flight?

Note that the fuel at the start was about 4169 mL and fuel left after landing was about 62.3 mL. To find the percent of the fuel left, evaluate the equation (1) _____

Evaluate $\frac{62.3}{4169} \cdot 100.$

$$\frac{62.3}{4169} \cdot 100 = \_\_\_\_\_ \%$$

(Type a whole number or a decimal. Round to the nearest tenth as needed.)

(1)
- $\frac{4169}{62.3} \cdot 100.$
- $\frac{62.3}{4169} \cdot 100.$
- $\frac{4169 \cdot 62.3}{100}.$
- $62.3 \cdot 100.$