Metric Vs Imperial Systems Practice

Consider the following statements.	
Statement 1	157 inches = 13 feet and 1 inch
Statement 2	15 miles ≅ 24 km
Statement 3	2.5 metres = 25 cm
Statement 4	5 kg ≅ 11 lbs

1. The incorrect statement is

   A) 1   B) 2   C) 3   D) 4

2. If 3.8 litres = 1 gallon, then $\frac{2}{5}$ of a gallon, accurate to 2 decimal places is _____ litres.

3. Blood sugar levels are measured in milligrams of glucose per decilitre of blood volume. If a person's blood sugar level measured 128 mg/dL, what is this in grams per litre?

   A) 1.28 g/L   B) 1.35 g/L   C) 1.44 g/L   D) 2.04 g/L

Use the following information to answer the next question.

The following information is regarding the Province of Saskatchewan.

Subject to certain exemptions for farm equipment, "no person shall, without a permit issued pursuant to *The Highways and Transportation Act*, operate, move or cause to be operated or moved on or over a provincial highway or provincial road," any vehicle, object, contrivance or combination of vehicles which exceed certain prescribed dimensions.

4. If the maximum height for a truck in California is 14 feet, is the height in Saskatchewan greater or less than the height in California? Justify.

Use the following diagram to answer the next question.
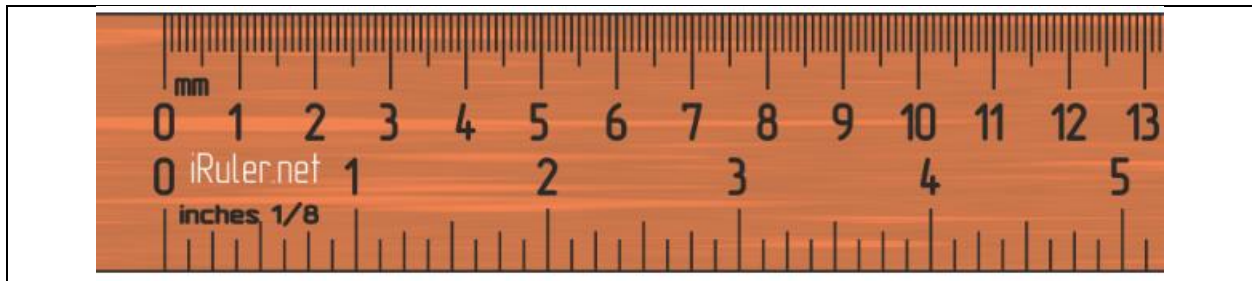
5. The length of the arrow at the bottom of the ruler is $2\frac{x}{4}$ inches. The value of x is

_____.

6. To carpet a 14 by 9-foot room, it costs $12.50 /yd². Given that 1 ft² = $\left(\frac{1}{9}\right) yd^2$, the cost to carpet the room is

A) $155   B) $175   C) $195   D) $215

7. Costco sells Atlantic salmon for $32.99/kg. The local store sells the same salmon for $17.50/lb. Which statement below is correct?

A) Costco's price is better by $2.50/lb.
B) Costco's price is better by $2.50/kg.
C) The local store's price is better by $2.50/lb.
D) The local store's price is better by $2.50/kg.

. Use the following formula below to answer the next question.

$$F = \left(\frac{9}{5}\right)C + 32, where\ F = Fahrenheit\ and\ C = Celsius$$

8. Suppose you are on vacation in the United States, and you hear that the high temperature for the day will be 84^0 F. To the nearest whole number, the equivalent temperature in Celsius is _____.

Use the following information to answer the next question.

Tony moved to a new country and rented 1 000 ft² of office space for his business. He was told that his was about the same as 1 000 m².

9. If 1 ft is equivalent to about 30 cm, what is the size of the office space in m², and do you think he will be happy with it?

A) 900 m². No, he has lost 100 m².
B) 90 m². No, the given information in no where near accurate.
C) 1 100 m². Yes, he gained 100 m².
D) 990 m². Yes, the difference is very close.

<u>Metric Vs Imperial Systems Practice Solutions</u>

Consider the following statements.	
Statement 1	157 inches = 13 feet and 1 inch
Statement 2	15 miles ≅ 24 km
Statement 3	2.5 metres = 25 cm
Statement 4	5 kg ≅ 11 lbs

1. The incorrect statement is

A) 1   B) 2   C) 3   D) 4

Solution

<u>Statement 1</u>

Since there are 12 inches in 1 foot, divide 12 into 157.

$\frac{157}{12} = 13\frac{1}{12}$ ft

Statement 1 is correct.

<u>Statement 2</u>

Since 1 mile is approximately equal to 1.6 km, we can set up a proportion.

$$\frac{1\ mile}{1.6\ km} = \frac{15\ miles}{x\ km}$$

Cross multiply.

(1)(x) = (1.6) (15)

x = 24 km

15 miles ≅ $24\ km$

Statement 2 is correct.

<u>Statement 3</u>

Since 1 m = 100 cm, 2.5 m = 250 cm

Statement 3 is incorrect.

Statement 4

Since 1 kg ≅ 2.2 lbs, 5 kg ≅ 11 lbs

Statement 4 is correct.

The correct answer is C.

2. If 3.8 litres = 1 gallon, then $\frac{2}{5}$ of a gallon, accurate to 2 decimal places is
   __1.52__ litres.

Solution

Set up a proportion.

$$\frac{3.8}{1} = \frac{x}{\left(\frac{2}{5}\right)}$$

Cross multiply.

$$(3.8)\left(\frac{2}{5}\right) = (1)(x)$$

1.52 = x

3. Blood sugar levels are measured in milligrams of glucose per decilitre of blood volume. If a person's blood sugar level measured 128 mg/dL, what is this in grams per litre?

   A) 1.28 g/L   B) 1.35 g/L   C) 1.44 g/L   D) 2.04 g/L

Solution

Use the following chart to convert.

To move from milligrams to grams, divide by 1000. Thus, 128 mg = 0.128 grams.

We now have, 0.128 g per decilitre.

As a proportion, $\frac{0.128\ g}{1\ dL} = \frac{x}{1\ L}$

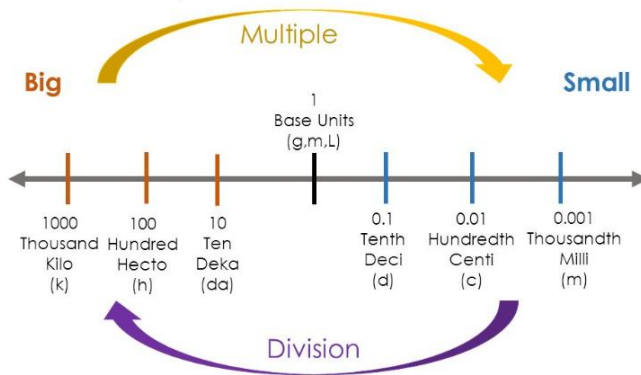$\frac{0.128\ g}{0.1\ L} = \frac{x}{1\ L}$ (Because 10 dL = 1 L)

Multiply the numerator and the denominator of the first part of the proportion by 10.

$$\frac{0.128\ g}{0.1\ L} \times \frac{10}{10} = \frac{1.28\ g}{1\ L}$$

The value is 1.28 g/L.

The correct answer is A.

Metric System Scale in NB

Or:

$$128\ \text{mg/dL} = \frac{128\ \cancel{\text{mg}}}{\cancel{\text{dL}}} \times \frac{1\ \text{g}}{1000\ \cancel{\text{mg}}} \times \frac{10\ \cancel{\text{dL}}}{\text{L}}$$

$$128\ \text{mg/dL} = 1.28\ \text{g/L}$$

Use the following information to answer the next question.

The following information is regarding the Province of Saskatchewan.

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4. If the maximum height for a truck in California is 14 feet, is the height in Saskatchewan greater or less than the height in California? Justify.

Solution

Use the base conversion unit: 1 ft = 0.3048 m
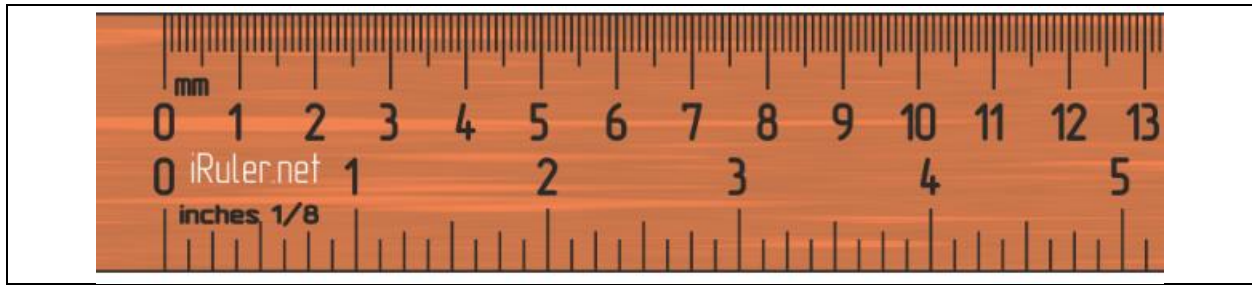
Set up a proportion:

$$\frac{1\ ft}{0.3048\ m} = \frac{14\ ft}{x}$$

Cross multiply.

(1)(x) = (14) (0.3048)

x = 4.2672 m

In California, the maximum height is 4.27 m and the maximum height in Saskatchewan is 4.14 m. The height is greater in California.

Use the following diagram to answer the next question.

5. The length of the arrow at the bottom of the ruler is $2\frac{x}{4}$ inches. The value of x is ___3___ .

Solution

The inches are divided into 8 equal intervals. In other words, the distance between each tick mark is $\frac{1}{8}$ of an inch. The tip of the arrow lines up with the sixth tick mark, or at $\frac{6}{8}$ of an inch. When $\frac{6}{8}$ is simplified, the result is $\frac{3}{4}$. The length of the arrow is $2\frac{3}{4}$ inches.

The value of x is 3.

6. To carpet a 14 by 9-foot room, it costs $12.50 /yd². Given that 1 ft² = $\left(\frac{1}{9}\right) yd^2$, the cost to carpet the room is

   A) $155   B) $175   C) $195   D) $215

Solution

The room is (14)(9), or 126 ft².

1 ft² = $\left(\frac{1}{9}\right) yd^2$

Multiply both sides of the equal sign by 126.

(126)1 ft² = (126) $\left(\frac{1}{9}\right) yd^2$

126 ft² = 14 yd²

Multiply the cost per yd² by 14.

($12.50) (14) = $175

The correct answer is B.

7. Costco sells Atlantic salmon for $32.99/kg. The local store sells the same salmon for $17.50/lb. Which statement below is correct?

A) Costco's price is better by $2.50/lb.
B) Costco's price is better by $2.50/kg.
C) The local store's price is better by $2.50/lb.
D) The local store's price is better by $2.50/kg.

Solution

Use the base conversion unit, 1 kg = 2.2 lbs

Costco sells salmon for $32.99 per 2.2 lbs.

$$\frac{32.99}{2.2} = \$15/lb$$

Since the local store sells salmon for $17.50/lb, the Costco price is better by $2.50/lb.

The correct answer is A.

. Use the following formula below to answer the next question.

$$F = \left(\frac{9}{5}\right)C + 32, where\ F = Fahrenheit\ and\ C = Celsius$$

8. Suppose you are on vacation in the United States, and you hear that the high temperature for the day will be 84^0 F. To the nearest whole number, the equivalent temperature in Celsius is __29^0__.

Solution

Substitute F = 84 and then isolate C.

$$F = \left(\frac{9}{5}\right)C + 32$$

$$(84) = \left(\frac{9}{5}\right)C + 32$$

Subtract 32 from both sides.

$$84 - 32 = \left(\frac{9}{5}\right)C + 32 - 32$$

Use the following information to answer the next question.

Tony moved to a new country and rented 1 000 ft^2 of office space for his business. He was told that his was about the same as 1 000 m^2.

9. If 1 ft is equivalent to about 30 cm, what is the size of the office space in m^2, and do you think he will be happy with it?

    A) 900 m^2. No, he has lost 100 m^2.
    B) 90 m^2. No, the given information in no where near accurate.
    C) 1 100 m^2. Yes, he gained 100 m^2.
    D) 990 m^2. Yes, the difference is very close.

Solution

Given that 1 ft = 30 cm, 1 ft^2 = 900 cm^3.

To convert 900 cm^2 to m^2, divide by 10 000.

900 cm^2 = 0.09 m^2

Thus, 1 ft^2 = 0.09 m^2

Multiply both sides of the equation by 1000.

(1000)1 ft^2 = (1000) 0.09 m^2

1000 ft^2 = 90 m^2.

The correct answer is B.