

Comparing and Interpreting Rates Practice

1. If you were travelling in your car at 50 miles/hour, the number of feet, to the nearest integer, you would be travelling in 1 second would be
A) 35 B) 56 C) 73 D) 91

2. On a shopping trip to Costco, you noticed that the Atlantic salmon filet costs \$32.99/kg. Later in the day, your local fish shop is selling the same salmon filets for \$23.40 for 650 grams. Costco's price is how many dollars per kilogram **better** than the local fish shop?
A) \$2 B) \$3 C) \$4 D) \$5

Use the following information to answer the next question.

Terry read that his car goes 24 miles to the US gallon. He wanted to convert to litres per 100 km. He looked online to find that 1 mile per gallon = 0.425144 km per litre. Analyze his work below.

Step 1	$\frac{1}{0.425144} = \frac{x}{24}$
Step 2	$(1)(24) = (x)(0.425144)$
Step 3	$\frac{24}{0.425144} = x$
Step 4	$x = 56.45\dots$

3. Unfortunately, Terry made an error. The step where Terry made his first mistake, **and** the correct answer is
A) Step 1 **and** the correct answer is 9.8 litres/100 km.
B) Step 3 **and** the correct answer is 9.8 litres/100 km.
C) Step 1 **and** the correct answer is 10.6 litres/100 km.
D) Step 3 **and** the correct answer is 10.6 litres/100 km.

Use the following information to answer the next question.

Consider the following tanks. Each tank is filled to capacity and the time to drain the tank is given in hours.

	Capacity	Time To Drain (Hours)
Tank A	275 L	1.8
Tank B	350 L	2.9
Tank C	425 L	2.1
Tank D	640 L	3.8

4. A) The tank with the slowest drain rate is ____.
B) The tank with the quickest drain rate, expressed as litres/min (nearest 10th) is _____
5. A cafeteria operator purchased a box of 15 navel oranges from a wholesaler for \$11.85. She then sold a single orange in her cafeteria for \$1.25. The amount of profit made for each orange sold is
- A) 46 cents B) 51 cents C) 56 cents D) 61 cents.

Use the following information to answer the next question.

The list price for Can A, a 975 ml can of paint, is \$23.15. For the same paint, Can B, which is 3.36 litres, costs \$49.85.

6. Which of the following statements is true?
- A) Can A costs \$0.015 per ml.
B) Can B costs \$0.024 per ml.
C) Can A costs \$23.74 per litre.
D) Can B costs \$16.84 per litre.

7. One store sells a 20 lb bag of grass seed for \$15.95, while a different store sells the same grass seed of 7 kg for \$13.69. Which is the better buy?

Comparing and Interpreting Rates Practice Solutions

1. If you were travelling in your car at 50 miles/hour, the number of feet, to the nearest integer, you would be travelling in 1 second would be

A) 35 B) 56 C) 73 D) 91

Solution

One mile = 5280 feet

One hour = (60)(60) seconds

One hour = 3600 seconds

In one hour, you would be travelling (50) (5280) feet; or 264 000 feet. This distance would be accomplished in 3600 seconds.

Set up a proportion.

$$\frac{264\,000\text{ ft}}{3600\text{ sec}} = \frac{x\text{ ft}}{1\text{ sec}}$$
$$\frac{264\,000 \div (3600)}{3600 \div (3600)} = \frac{73.33 \dots}{1}$$

You would be travelling about 73 feet per second.

The correct answer is C.

2. On a shopping trip to Costco, you noticed that the Atlantic salmon fillet costs \$32.99/kg. Later in the day, your local fish shop is selling the same salmon filets for \$23.40 for 650 grams. Costco's price is how many dollars per kilogram **better** than the local fish shop?

A) \$2 B) \$3 C) \$4 D) \$5

Solution

Since the local fish shop sells its fillets of 650 grams for \$23.40, determine the price for 1000 grams (1 kg), and compare this price to the Costco price.

$$\frac{23.40}{650} = \frac{x}{1000}$$

Cross multiply.

$$(23.40)(1000) = (x)(650)$$

$$\frac{(23.40)(1000)}{650} = x$$

$$x = 36$$

The equivalent price per kilogram at the fish shop is \$36/kg. Costco's price is about \$3/kg better.

The correct answer is B.

Use the following information to answer the next question.

Terry read that his car goes 24 miles to the US gallon. He wanted to convert to litres per 100 km. He looked online to find that 1 mile per gallon = 0.425144 km per litre. Analyze his work below.

Step 1	$\frac{1}{0.425144} = \frac{x}{24}$
Step 2	$(2)(24) = (x)(0.425144)$
Step 3	$\frac{24}{0.425144} = x$
Step 4	$x = 56.45\dots$
Step 5	$\frac{56.45\dots}{1} = \frac{100}{x}$
Step 6	$x = 1.8$

3. Unfortunately, Terry made an error. The step where Terry made his first mistake, **and** the correct answer is

- A) Step 1 **and** the correct answer is 9.8 litres/100 km.
- B) Step 3 **and** the correct answer is 9.8 litres/100 km.
- C) Step 1 **and** the correct answer is 10.6 litres/100 km.
- D) Step 3 **and** the correct answer is 10.6 litres/100 km.

Solution

The first error occurs in step 1. The initial proportion is set up as miles per gallon over km per litre. The equivalent proportion must also be miles per gallon over km per litre. Step 1 should be:

$$\frac{1}{0.425144} = \frac{24}{x}$$

The following correct work is:

$$(1) (x) = (24) (0.425144) \\ x = 10.20\dots$$

$$\frac{10.20 \dots}{1} = \frac{100}{x} \\ x = \frac{100}{10.20 \dots}$$

$$x = 9.8 \text{ litres/100 km}$$

The correct answer is A.

Use the following information to answer the next question.

Consider the following tanks. Each tank is filled to capacity and the time to drain the tank is given in hours.

	Capacity	Time To Drain (Hours)
Tank A	275 L	1.8
Tank B	350 L	2.9
Tank C	425 L	2.1
Tank D	640 L	3.8

4. A) The tank with the slowest drain rate is B.

B) The tank with the quickest drain rate, expressed as litres/min (nearest 10th) is 3.4

Solution

Divide hours to drain into capacity to determine the rates per hour.

$$\text{Tank A} = \frac{275}{1.8} = 152.777... \text{ l/hr}$$

$$\text{Tank B} = \frac{350}{2.9} = 120.689... \text{ l/hr}$$

$$\text{Tank C} = \frac{425}{2.1} = 202.380... \text{ l/hr}$$

$$\text{Tank D} = \frac{640}{3.8} = 168.421... \text{ l/hr}$$

The tank with the slowest drain rate is B.

The quickest drain rate is Tank C at 202.380...l/hr. Since there are 60 min in an hour, divide 60 into 202.380....

$$202.380... \div 60 = 3.373....$$

The rate for the quickest tank is 3.4 l/min.

5. A cafeteria operator purchased a box of 15 navel oranges from a wholesaler for \$11.85. She then sold a single orange in her cafeteria for \$1.25. The amount of profit made for each orange sold is

A) 46 cents B) 51 cents C) 56 cents D) 61 cents.

Solution

The cost per orange from the wholesaler is $\frac{11.85}{15} = 0.79$.

The difference between 79 cents and a dollar and 25 cents is 46 cents.

The correct answer is A.

Use the following information to answer the next question.

The list price for Can A, a 975 ml can of paint, is \$23.15. For the same paint, Can B, which is 3.36 litres, costs \$49.85.

6. Which of the following statements is true?

- A) Can A costs \$0.015 per ml.
- B) Can B costs \$0.024 per ml.
- C) Can A costs \$23.74 per litre.
- D) Can B costs \$16.84 per litre.

Solution

Cost per ml

$$\text{Can A: } \frac{23.15}{975} = 0.023 \dots$$

$$\text{Can B: } \frac{49.85}{3360} = 0.014 \dots$$

Statements A and B are both false.

Cost per litre

$$\text{Can A: } \frac{23.15}{0.975} = 23.74 \dots$$

$$\text{Can B: } \frac{49.85}{3.36} = 14.83 \dots$$

Statement C is true and statement D is false.

The correct answer is C.

7. One store sells a 20 lb bag of grass seed for \$15.95, while a different store sells the same grass seed of 7 kg for \$13.69. Which is the better buy?

Solution

The first store that sells by the pound, has a unit rate of $\frac{15.95}{20} = \$0.80/lb$

For the second store, the number of pounds in 7 kg is (7) (2.2) or 15.4. The unit rate for this store is $\frac{13.69}{15.4} = \$0.89/lb$.

The better buy is the first store that sells the 20 lb bag.