Name Key
Math 8A

Date
1- Regents Review

Regents Review: Do Now #2

Old Conversion Chart:

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5280 feet	1 pound = 0.454 kilogram	1 quart = 2 pints
1 mile = 1760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallon
		1 liter = 1000 cubic centimeters

New Conversion Chart:

Conversions	**Conversions Across Measurement Systems**
1 mile = 5280 feet	1 inch = 2.54 centimeters
1 mile = 1760 yards	1 meter = 39.37 inches
1 pound = 16 ounces	1 mile = 1.609 kilometers
1 ton = 2000 pounds	1 kilometer = 0.6214 mile
	1 pound = 0.454 kilogram
	1 kilogram = 2.2 pounds

* you can cross-simplify the units diagonally or horizontally

Common Core Regents Questions

1. A construction worker needs to move 120 ft^3 of dirt by using a wheelbarrow. One wheelbarrow load holds 8 ft^3 of dirt and each load takes him 10 minutes to complete. One correct way to figure out the number of hours he would need to complete this job is

start

(1) $\frac{120\ ft^3}{1} \cdot \frac{10\ min}{1\ load} \cdot \frac{60\ min}{1\ hr} \cdot \frac{1\ load}{8\ ft^3}$

(2) $\frac{120\ ft^3}{1} \cdot \frac{60\ min}{1\ hr} \cdot \frac{8\ ft^3}{10\ min} \cdot \frac{1}{1\ load}$

(3) $\frac{120\ ft^3}{1} \cdot \frac{1\ load}{10\ min} \cdot \frac{8\ ft^3}{1\ load} \cdot \frac{1\ hr}{60\ min}$

(4) $\frac{120\ ft^3}{1} \cdot \frac{1\ load}{8\ ft^3} \cdot \frac{10\ min}{1\ load} \cdot \frac{1\ hr}{60\ min}$

what you need to end with

ft → hours

2. The following conversion was done correctly:

$$\frac{3\ miles}{1\ hour} \cdot \frac{1\ hour}{60\ minutes} \cdot \frac{5280\ feet}{1\ mile} \cdot \frac{12\ inches}{1\ foot}$$

inches / min

What were the final units for this conversion?

(1) Minutes per foot

(2) Minutes per inch

(3) feet per minute

(4) inches per minute

yd/sec → mi/hr

3. Peyton is a sprinter who can run the 40-yard dash in 4.5 seconds. He converts his speed into miles per hour, as shown below.

$$\frac{40\ yd}{4.5\ sec} \cdot \frac{3\ ft}{1\ yd} \cdot \frac{5280\ ft}{1\ mi} \cdot \frac{60\ sec}{1\ min} \cdot \frac{60\ min}{1\ hr}$$

Which ratio is *incorrectly* written to convert his speed?

(1) $\frac{3\ ft}{1\ yd}$

(2) $\frac{5280\ ft}{1\ mi}$

(3) $\frac{60\ sec}{1\ min}$

(4) $\frac{60\ min}{1\ hr}$

4. Olivia entered a baking contest. As part of the contest, she needs to demonstrate how to measure a gallon of milk if she only has a teaspoon measure. She converts the measurement using the ratios below:

$$\frac{4\ quarts}{1\ gallon} \bullet \frac{2\ pints}{1\ quart} \bullet \frac{2\ cups}{1\ pint} \bullet \frac{\frac{1}{4}\ cup}{4\ tablespoons} \bullet \frac{3\ teaspoons}{1\ tablespoon}$$

Which ratio is *incorrectly* written in Olivia's conversion?

(1) $\frac{4\ quarts}{1\ gallon}$

(2) $\frac{2\ pints}{1\ quart}$

(3) $\frac{\frac{1}{4}\ cup}{4\ tablespoons}$

(4) $\frac{3\ teaspoons}{1\ tablespoon}$

5. Which expression can be used to change 75 kilometers per hour to meters per minute?

1) $\frac{75\ km}{1\ hr} \times \frac{1\ km}{1{,}000\ m} \times \frac{1\ hr}{60\ min}$

2) $\frac{75\ km}{1\ hr} \times \frac{1\ km}{1{,}000\ m} \times \frac{60\ min}{1\ hr}$

3) $\frac{75\ km}{1\ hr} \times \frac{1{,}000\ m}{1\ km} \times \frac{1\ hr}{60\ min}$

4) $\frac{75\ km}{1\ hr} \times \frac{1{,}000\ m}{1\ km} \times \frac{60\ min}{1\ hr}$

6. When the temperature is 59°F, the speed of sound at sea level is 1225 kilometers per hour. Which process could be used to convert this speed into feet per second?

(1) $\frac{1225\ km}{1\ hr} \bullet \frac{0.62\ mi}{1\ km} \bullet \frac{1\ hr}{60\ min} \bullet \frac{1\ mi}{5280\ ft} \bullet \frac{1\ min}{60\ sec}$

(2) $\frac{1225\ km}{1\ hr} \bullet \frac{0.62\ mi}{1\ km} \bullet \frac{5280\ ft}{1\ mi} \bullet \frac{1\ hr}{60\ min} \bullet \frac{1\ min}{60\ sec}$

(3) $\frac{1225\ km}{1\ hr} \bullet \frac{1\ km}{0.62\ mi} \bullet \frac{5280\ ft}{1\ mi} \bullet \frac{1\ hr}{60\ min} \bullet \frac{1\ min}{60\ sec}$

(4) $\frac{1225\ km}{1\ hr} \bullet \frac{0.62\ mi}{1\ km} \bullet \frac{5280\ ft}{1\ mi} \bullet \frac{60\ min}{1\ hr} \bullet \frac{1\ min}{60\ sec}$

7. Joe compared gas prices in England and New York State one day. In England, gas sold for 1.35 euros per liter, and one dollar equaled 0.622 euros. A correct way to figure out this cost, in dollars per gallon, is

(1) $\frac{1.35\ euros}{1\ L} \bullet \frac{1\ L}{0.264\ gal} \bullet \frac{\$1.00}{0.622\ euros}$

(2) $\frac{1.35\ euros}{1\ L} \bullet \frac{\$1.00}{0.622\ euros} \bullet \frac{0.264\ gal}{1\ L}$

(3) $\frac{1.35\ euros}{1\ L} \bullet \frac{1\ L}{0.264\ gal} \bullet \frac{0.622\ euros}{\$1.00}$

(4) $\frac{1.35\ euros}{1\ L} \bullet \frac{0.622\ euros}{\$1.00} \bullet \frac{0.264\ gal}{1\ L}$

8. A company ships an average of 30,000 items each week. The approximate number of items shipped each minute is calculated using the conversion

(1) $\frac{30{,}000 \text{ items}}{1 \text{ week}} \cdot \frac{7 \text{ days}}{1 \text{ week}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ day}}{24 \text{ hrs}}$

(2) $\frac{30{,}000 \text{ items}}{1 \text{ week}} \cdot \frac{1 \text{ week}}{7 \text{ days}} \cdot \frac{1 \text{ day}}{24 \text{ hrs}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$

(3) $\frac{1 \text{ week}}{30{,}000 \text{ items}} \cdot \frac{1 \text{ week}}{7 \text{ days}} \cdot \frac{1 \text{ day}}{24 \text{ hrs}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$

(4) $\frac{1 \text{ week}}{30{,}000 \text{ items}} \cdot \frac{7 \text{ days}}{1 \text{ week}} \cdot \frac{24 \text{ hrs}}{1 \text{ day}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$

items/week → items/minut

9. The Utica Boilermaker is a 15-kilometer road race. Sara is signed up to run this race and has done the following training runs:

I. 10 miles

II. 44,880 feet

III. 15,560 yards

Which run(s) are at least 15 kilometers?

(1) I, only

(2) II, only

(3) I and III

(4) II and III

10 mi

$\frac{10 \text{ mi}}{1} \cdot \frac{1.609 \text{ km}}{1 \text{ mi}} = 16.09 \text{ km}$ ✓

44,880 ft ✗ ft → mi → km

$44{,}880 \text{ ft} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \cdot \frac{1.609 \text{ km}}{1 \text{ mi}} = \frac{72{,}238.92}{5280}$

$\approx 14.590704545...$

15560 yd ✗ yd → mi → km

$15560 \text{ yd} \cdot \frac{1 \text{ mi}}{1760 \text{ yd}} \cdot \frac{1.609 \text{ km}}{1 \text{ mi}} = \frac{2503.604}{1760} \approx 14.225022727...$

10. A typical marathon is 26.2 miles. Allan averages 12 kilometers per hour when running in marathons. Determine how long it would take Allan to complete a marathon, to the *nearest tenth of an hour*. Justify your answer.

mi → km → hr

$26.2 \text{ mi} \cdot \frac{1.609 \text{ km}}{1 \text{ mi}} \cdot \frac{1 \text{ hour}}{12 \text{ km}} = \frac{42.1558...}{12} \quad 3.5129833...$

3.5 hours