

Algebra 1 · Units, Quantities and Modeling · Quiz

Common Core N-Q.A.1, N-Q.A.2, N-Q.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Try these ten multiple-choice questions on conversion factors, unit analysis, slopes with units, graph scales and rounding. Pick one answer for each question, then read the explanation to learn from any mistake.

Algebra 1 Common Core: N-Q.A.1 · N-Q.A.2 · N-Q.A.3

Questions

Question 1

Which conversion factor changes minutes into seconds?

- A. $\frac{1 \text{ s}}{60 \text{ min}}$
- B. $\frac{60 \text{ min}}{1 \text{ s}}$
- C. $\frac{60 \text{ s}}{1 \text{ min}}$
- D. $\frac{1 \text{ min}}{60 \text{ s}}$

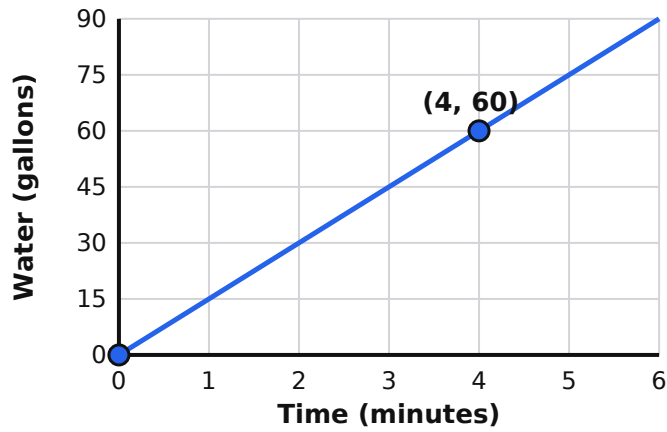
Question 2

What is the unit of $\frac{\text{miles}}{\text{gallon}} \times \frac{\text{gallons}}{\text{dollar}}$?

- A. gallons per mile
- B. dollars per mile
- C. miles per gallon
- D. miles per dollar

Question 3

A pump fills a tank as shown. What are the units and value of the slope?



Water pumped over time.

- A. 15 gallons per minute
- B. 15 minutes per gallon
- C. 60 gallons per minute
- D. 4 gallons per minute

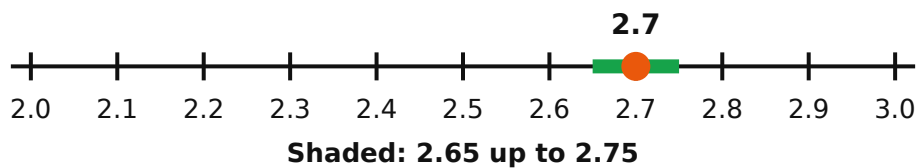
Question 4

Convert 1.5 h to seconds.

- A. 90 s
- B. 540 s
- C. 3,600 s
- D. 5,400 s

Question 5

A ruler marked in tenths of an inch shows 2.7 in. Which describes the actual length L ?



A reading of 2.7 inches.

- A. $2.6 \leq L < 2.8$
- B. $2.65 \leq L < 2.75$
- C. $2.7 \leq L < 2.8$
- D. $2.69 \leq L < 2.71$

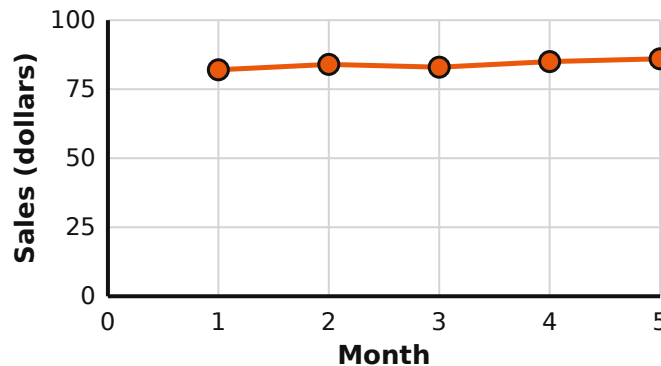
Question 6

A rectangle measures 4.2 in by 3.1 in (each to the nearest tenth). The calculator shows 13.02 in^2 . Which is the best report?

- A. 13.02 in^2
- B. 13 in^2
- C. 13.0 in^2
- D. 13.020 in^2

Question 7

The graph's data are 82, 84, 83, 85, 86, but the line looks flat. Which change makes the differences easier to see?



Sales on an axis from 0 to 100.

- A. Use a vertical axis from 80 to 88 with steps of 2
- B. Use a vertical axis from 0 to 1,000
- C. Use a vertical axis from 0 to 200 with steps of 100
- D. Remove the labels on the vertical axis

Question 8

Let x be the number of years since 2015. Which year has $x = 8$?

- A. 2023
- B. 2007
- C. 2015
- D. 2025

Question 9

Convert 3 yd^2 to square feet.

- A. 9 ft^2
- B. 81 ft^2
- C. 27 ft^2
- D. 3 ft^2

Question 10

A box of 24 ounces of cereal costs \$3.60. What is the cost per ounce?

- A. \$0.24

- B. \$6.67
- C. \$1.50
- D. \$0.15

Answer key

1. **C** – Minutes must cancel, so minutes go in the denominator and seconds in the numerator. The common mistake is flipping the factor.
2. **D** – Gallons cancel, leaving miles in the numerator and dollars in the denominator.
3. **A** – Slope = change in gallons over change in minutes = $60 / 4 = 15$, so the units are gallons per minute.
4. **D** – $1.5 \times 60 = 90$ minutes, and $90 \times 60 = 5,400$ seconds. Stopping at 90 gives minutes, not seconds.
5. **B** – The reading is accurate to the nearest tenth, so the true value is within 0.05 of 2.7.
6. **B** – Each input has two significant digits, so the product is reported with two: 13.
7. **A** – A scale that starts near the lowest value and fits the data range spreads the points out. A larger axis range flattens the line further.
8. **A** – $2015 + 8 = 2023$. Subtracting gives 2007, which is a common slip.
9. **C** – One square yard is $3 \times 3 = 9$ square feet, so 3 square yards is 27 square feet. Using only 3 forgets to square the factor.
10. **D** – $3.60 / 24 = 0.15$ dollars per ounce. Dividing the other way gives ounces per dollar.

Remember:

- Standards N-Q.A.1, N-Q.A.2 and N-Q.A.3: use units to solve problems, define quantities for modeling, and choose a level of accuracy.
- A conversion factor equals 1, so it changes units without changing the value.
- Square the factor for area units and cube it for volume units.
- A scale and origin that fit the data make a graph readable, and labels keep it honest.
- A measurement to the nearest tenth has a possible error of 0.05.