

Algebra 1 · Units, Quantities and Modeling · Test

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

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

This test checks unit conversion, unit analysis, defining quantities, graph scales and accuracy. It has eight questions worth 20 points in total. Show every step and include units in each answer.

Test information

- **Grade:** Algebra 1
- **Chapter:** Units, Quantities and Modeling
- **Common Core:** N-Q.A.1, N-Q.A.2, N-Q.A.3
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 3 pts; Question 3: 2 pts; Question 4: 3 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 2 pts)

Question 1: Two conversions (2 points)

- Convert 3.25 mi to feet. (1 point)
- Convert 252 min to hours. (1 point)

Question 2: Speed in feet per second (3 points)

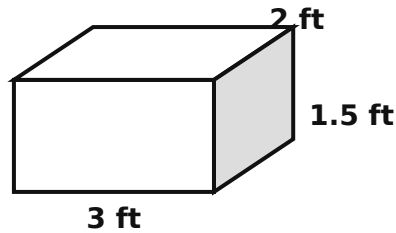
A race car travels at 55 mi/h . Write the conversion to feet per second as a product of fractions and find the speed to the nearest tenth. (3 points)

Question 3: Units of a quotient (2 points)

A truck uses fuel at a constant rate. It travels 60 mi/h and gets 30 mi/gal . Find the quotient $\frac{60 \text{ mi/h}}{30 \text{ mi/gal}}$, including its units, and explain what it measures. (2 points)

Question 4: Filling a container (3 points)

A container is a rectangular box 3 ft long, 2 ft wide and 1.5 ft tall. A hose fills it at 8 gal/min , and 1 ft^3 holds 7.48 gallons.

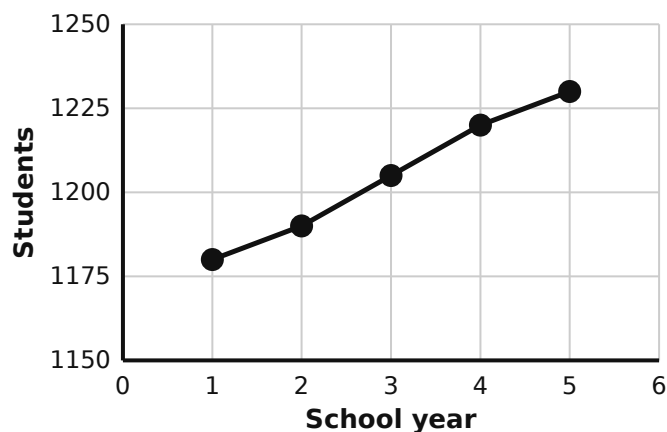


Box with dimensions.

- Find the volume in cubic feet. (1 point)
- Find the capacity in gallons. (1 point)
- Find the filling time in minutes, to the nearest tenth. (1 point)

Question 5: Scale of a graph (3 points)

The graph shows enrollment at Lincoln High School, in students, over five school years (Year 1 is 2020).



Enrollment, vertical axis starting at 1150.

- Find the increase from Year 1 to Year 5. (1 point)
- Find what percent of the graph's vertical axis height this increase covers. (1 point)
- Find what percent it would cover if the vertical axis ran from 0 to 1250, and state which graph makes the change look larger. (1 point)

Question 6: Defining a quantity (2 points)

A courier charges \$20 plus \$0.50 per mile. Define variables with units and write an equation for the cost (1 point), then find the cost of an 18-mile delivery (1 point).

Question 7: Accuracy of a poster (3 points)

A rectangular poster measures 24.5 in by 18.2 in, each measured to the nearest tenth.



Poster dimensions.

- Find the area and report it with an appropriate level of accuracy. (2 points)
- Write an inequality for the actual width w . (1 point)

Question 8: Trip planning (2 points)

Sofia's car gets 25 mi/gal and gas costs \$4.00 per gallon. Find the gas needed for a 350-mile trip, the cost of that gas, and the cost per mile. (2 points)