MATH DOESN'T SUCK

Solution Guide – Chapter 17

Rates and Unit Rates

Doing the Math from p. 206-7

2) You ran 32 miles in 5 days, and we need the number of miles per day – so we'll want a "single day" on the bottom – a unit rate.

Seeing the "per" right before the word "day," we know to put "days" in the denominator.

So our rate fraction looks like: $\frac{32\,miles}{5\,days}$ and since they asked "per day", we need to divide top and bottom by 5, so we get 1 as the denominator, without changing the value of the fraction: $\frac{32 \div \mathbf{5}}{5 \div \mathbf{5}}$

Using decimal division on the top, we get: $5\overline{)32.0}^{\,6.4}$, so our unit rate is: $\frac{6.4\,miles}{1\,day}$.

You ran **6.4 miles per day**, not bad!

Answer: $\mathbf{\frac{6.4\,miles}{1\,day}}$

3) We want the rate of "kids to cars" so we'll put kids on top: $\frac{10\ kids}{14\ cars}$.

It didn't ask for "number of kids *per* car" so we don't need to make it a unit rate.

So let's reduce it like a normal fraction. $\frac{10 \div \mathbf{2}}{14 \div \mathbf{2}} = \frac{5}{7}$. It's reduced now, since 5 and 7 don't share any common factors. (actually, they're both prime!)

So there were 5 kids for every 7 cars.

Sometimes that's all you need to do; if it's not a unit rate, just reduce the fraction of the ratio you want!

Answer: $\frac{\mathbf{5\ kids}}{\mathbf{7\ cars}}$

4) We want the unit price per bottle, so our fraction looks like: $\frac{\$12.50}{5\ bottles}$, and now we need to divide top and bottom by 5, to get "1 bottle" on the bottom: $\frac{12.50 \div \mathbf{5}}{5 \div \mathbf{5}}$

Decimal divison on the top gives us: $5\overline{)12.50}$, so our unit fraction looks like: $\frac{\$2.50}{1\ bottle}$

It cost **$2.50 per bottle** of water.

Answer: $\frac{\mathbf{\$2.50}}{\mathbf{1\ bottle}}$

5) We need the price *per foot*, so we'll put the "feet of ribbon" on the bottom: $\frac{\$2.88}{3.2\ ft.}$, and plan to find the unit rate.

To get the unit rate, we need to divide top and bottom by 3.2: $\frac{2.88 \div \mathbf{3.2}}{3.2 \div \mathbf{3.2}}$

Decimal division on top gives us: $3.2\overline{)2.88}$ (we'll need to move decimal point on both the divisor and dividend to get rid of the decimal point in the divisor) → $32\overline{)28.8}$

So our unit fraction is: $\frac{\$0.90}{1\ ft.}$ which means that it cost **90 cents per foot**.

Answer: $\frac{\mathbf{\$0.90}}{\mathbf{1\ ft.}}$