MATH DOESN'T SUCK

Solution Guide – Chapter 13

Converting Percents to and from Decimals and Fractions

Doing the Math from p. 167

2) 5% = ?

Drop the % sign: 5, and now move the decimal 2 places to the *left*: 0.05

Answer: 5% = **0.05**

3) 0.75 = ?

Move decimal two places to *right*: 75, and now add % sign.

Answer: 0.75 = **75%**

4) 500% = ?

Drop % sign: 500. Now move the decimal 2 places to the *left*: 5.00

Answer: 500% = **5**

5) 0.09% = ?

Drop the % sign: 0.09 Now move the decimal 2 places to the left 0.0009

Answer: 0.09% = **0.0009**

6) 1.44 = ?

Move the decimal 2 places to the right: 144. Now add the % sign:

Answer: 1.44 = **144%**

7) $\frac{1}{2}\% = ?$

Well, we know that $\frac{1}{2} = 0.5$, which means that $\frac{1}{2}\% = 0.5\%$.
So let's rewrite this problem and ask instead:
0.5% = ?

See how it has the exact same value, only this is easier to solve?

And now, like always, to convert *from* a percent, we just remove the % and move the decimal 2 places to the *left*: 0.005
Answer: $\frac{1}{2}\%$ = **0.005**

Doing the Math from p. 171

2) 25% = ?

Drop the % sign, and put the number over 100: $\frac{25}{100}$. Now reduce. $\frac{25 \div \mathbf{25}}{100 \div \mathbf{25} = \frac{1}{4}}$

Answer: 25% = $\mathbf{\frac{1}{4}}$

3) $\frac{1}{5}\% = ?$

As always, to go from percents to fractions, drop the % sign, and put the number over 100: $\frac{\frac{1}{5}}{100}$. To simplify this complex fraction, we'll want to make it "tall and skinny first" and convert 100 to an improper fraction: $\frac{\frac{1}{5}}{\frac{100}{1}}$ Now we can use "means and extremes"

and the *extremes* multiply to create the numerator: $1 \times 1 = 1$. We multiply the *means* to get the denominator: $5 \times 100 = 500$. And the fraction simplifies to: $\frac{1}{500}$.

Answer: $\frac{1}{5}\% = \mathbf{\frac{1}{500}}$

4) What is 75% of $60?

You can't multiply a percent, so first we convert 75% to a fraction. Drop the % and put the number over 100: $\frac{75}{100}$. Reduce: $\frac{75 \div \mathbf{25}}{100 \div \mathbf{25}} = \frac{3}{4}$

Now our problem becomes (substituting $\frac{3}{4}$ for 75%):

What is $\frac{3}{4}$ of $60?

Whenever "of" is *immediately* surrounded by two numbers, we know to multiply them together. So we multiply $\frac{3}{4} \times 60 = \frac{3}{4} \times \frac{60}{1} = \frac{3 \times 60}{4 \times 1} = \frac{180}{4}$, and now reduce:

$\frac{180 \div \mathbf{4}}{4 \div \mathbf{4}} = \frac{45}{1} = 45.$

Answer: 75% of $60 = **$45**

Doing the Math from p. 173

2) $\frac{1}{2} = ?$

(I know this is an easy problem, but it's good practice to see how the method works!)

First, tip over the fraction and divide: $\frac{1}{2} \rightarrow 2\overline{)1.0}$ (quotient 0.5)

Now that we have a decimal, 0.5, we can move the decimal point over two places to the *right* and add a percent sign.

Answer: $\frac{1}{2}$ = **50%**

3) $\frac{3}{2} = ?$

Tip over the fraction and divide: $\frac{3}{2} \rightarrow 2\overline{)3.0}$ $\overline{1.5}$

Now that we have a decimal, 1.5, we can move the decimal point over two places to the *right* and add a percent sign.

Answer: $\frac{3}{2}$ = **150%**

4) 4 = ?

You could rewrite this as the fraction $\frac{4}{1}$, tip the fraction over and divide, and get 4… or let's face it, you could just treat 4 like a decimal already and just move the decimal point two places to the *right* and add the % sign.

Answer: 4 = **400%**