MATH DOESN'T SUCK

Solution Guide – Chapter 15

Introduction to Word Problems, and "Percent Of"/"Percent Off" Problems

Doing the Math from p. 188

2) What is 0.6 of 10?

Since "of" is immediately surrounded by two numbers, we can multiply them together!

Answer: 0.6×10

3) What is one third of 30 oranges?

Since "of" is immediately surrounded by two numbers, we can multiply them together!

Answer: $\frac{1}{3} \times 30$

4) What is sixteen percent of $\frac{1}{3}$ of \$600?

Sixteen percent = 16% = 0.16, and we've converted it into a decimal because we can't multiply percents. Any time "of" is surrounded by two numbers, the "of" translates into multiplication, so:

0.16 **of** $\frac{1}{3}$ **of** \$600 = $0.16 \times \frac{1}{3} \times \$600$

Answer: **$0.16 \times \frac{1}{3} \times \$600$**

5) What 60% **off of** ten dollars?

Notice that 0.6×10 is "60% **of** ten dollars", so 60% **off of** ten dollars would be the same as *subtracting* 60% of ten dollars *from* ten dollars. That would be: $10 - (0.6 \times 10)$.

Another way to think of it would be that "60% *off of* ten dollars" is the same as 40% *of* ten dollars, which would be 0.4×10.

Answer: $10 - (0.6 \times 10)$ or **0.4×10**

Doing the Math from p. 191

2) We need to find 30% **off of** \$30.

First, let's find 30% **of** \$30.
When "of" is *immediately* surrounded by two numbers, we can just translate "of" into multiplication: $30\% \times \$30$.

We need to convert the percent into a decimal before we can multiply: 30% = 0.3
And $0.3 \times 30 = 9$. This means 20% of \$40 = \$9.
So to find 30% *off of* \$30, we subtract the \$9 from the original \$30:
\$30 - \$9 = \$21.

Answer: 30% off of \$30 = **\$21**

3) We need to find $\frac{1}{3}$ off of \$120.

First, let's find $\frac{1}{3}$ *of* \$120.

We can substitute "of" for multiplication now, so: $\frac{1}{3} \times 120 = \frac{1}{3} \times \frac{120}{1} = \frac{120}{3}$. We want our answer to be in terms of money, so that's decimals. To make this a decimal, let's tip it over and divide: $\frac{120}{3} \rightarrow 3\overline{)120}^{40}$. So, now we know that $\frac{1}{3}$ of \$120 = \$40. But that's not our answer yet. We needed to find $\frac{1}{3}$ *off of* \$120. So that's \$120 - \$40 = \$80.

Answer: $\frac{1}{3}$ off of \$120 = **\$80.**

4) We need 40% **off of** the cover price, which is normally $2.50.
First, let's find 40% **of** the cover price. So, converting 40% into a decimal, we get 0.4. Now let's multiply that by $2.50: $0.4 \times 2.5 = 1$. So 40% of $2.50 = $1. Then to find 40% **off of** $2.50, let's subtract: $2.50 - $1 = $1.50.

Answer: 40% off of the $2.50 cover price = **$1.50 per magazine.**

Second part: How much will we pay for the whole year? That's just 12 months of $1.50 each. So we should multiply: $12 \times \$1.50 = \$18$.

Answer: For the full year, we'd pay **$18**.