MATH DOESN'T SUCK

Solution Guide – Chapter 5

Multiplying and Dividing Fractions… and Reciprocals

Doing the Math from p. 53

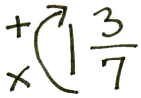
2) $\frac{1}{2} \times 2$

First, we should convert 2 into an improper fraction, and then we can multiply across the top and bottom: $\frac{1}{2} \times \frac{2}{1} = \frac{1 \times 2}{2 \times 1} = \frac{2}{2} = 1.$

Answer: $\frac{1}{2} \times 2 = \mathbf{1}$

3) $1\frac{3}{7} \times \frac{1}{3}$

First, we need to convert $1\frac{3}{7}$ into an improper fraction. Let's use the MAD face method:



M: multiply $7 \times 1 = 7$ and

A: add $7 + 3 = 10$. Then we put the 10 on top of the

D: denominator, so we get $1\frac{3}{7} = \frac{10}{7}$.

Now we can proceed with the multiplication: $\frac{10}{7} \times \frac{1}{3} = \frac{10 \times 1}{7 \times 3} = \frac{10}{21}$.

Answer: $1\frac{3}{7} \times \frac{1}{3} = \mathbf{\frac{10}{21}}$

Doing the Math from p. 56

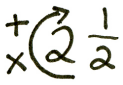
2) $\frac{8}{3}$

To find the reciprocal, since it's already an improper fraction, we can just flip it.

Answer: The reciprocal of $\frac{8}{3}$ is $\mathbf{\frac{3}{8}}$.

3) $2\frac{1}{2}$

Before we can flip it, let's use the MAD face method to write it as an improper fraction.



M: multiply $2 \times 2 = 4$, and then

A: add $4 + 1 = 5$. Then we put the 5 over the

D: denominator, and get $2\frac{1}{2} = \frac{5}{2}$. Now flip it!

Answer: The reciprocal of $2\frac{1}{2}$ is $\mathbf{\frac{2}{5}}$.

4) $\frac{19}{286}$

Since we don't have to deal with any whole numbers or mixed numbers, we can just flip it!

Answer: The reciprocal of $\frac{19}{286}$ is $\mathbf{\frac{286}{19}}$.

5) 9

First we need to rewrite it as an improper fraction: $9 = \frac{9}{1}$. *Now* we can flip it!

Answer: The reciprocal of 9 is $\mathbf{\frac{1}{9}}$.

Doing the Math from p. 59

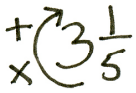
2) $\frac{4}{5} \div \frac{3}{2}$

We just flip the second fraction, and multiply: $\frac{4}{5} \times \frac{2}{3} = \frac{4 \times 2}{5 \times 3} = \frac{8}{15}$

Answer: $\frac{4}{5} \div \frac{3}{2} = \mathbf{\frac{8}{15}}$

3) $3\frac{1}{5} \div 5$

Before "doing" anything with these numbers, we need to rewrite them both as improper fractions. Using the MAD face method on $3\frac{1}{5}$:



We get that $3\frac{1}{5} = \frac{16}{5}$. And we know that 5 is the same as $\frac{5}{1}$. So now the problem looks like: $\frac{16}{5} \div \frac{5}{1}$. Now we flip the second fraction and multiply: $\frac{16}{5} \times \frac{1}{5} = \frac{16 \times 1}{5 \times 5} = \frac{16}{25}$.

Answer: $3\frac{1}{5} \div 5 = \mathbf{\frac{16}{25}}$

4) $\frac{1}{2} \div 3$

First we need to rewrite the 3 as an improper fraction: $3 = \frac{3}{1}$.

Now for the division problem $\frac{1}{2} \div \frac{3}{1}$, we just need to flip the second fraction and multiply: $\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$.

Answer: $\frac{1}{2} \div 3 = \mathbf{\frac{1}{6}}$