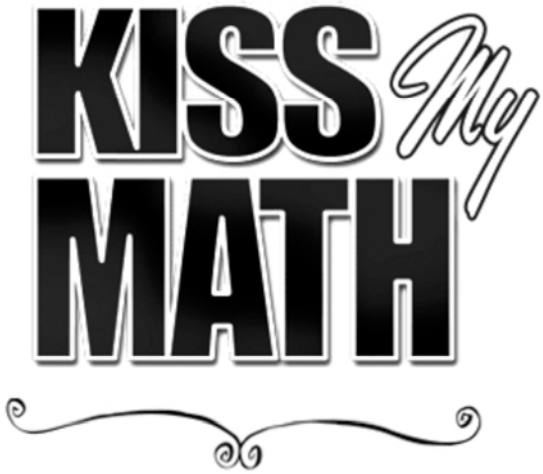

Solution Guide for Chapter 10

Here are the solutions for the "Doing the Math" exercises in *Kiss My Math*!

DTM from p.133-4

2. $14\left(\frac{8}{7}+\frac{3}{14}\right)$ = ?

So, let's distribute the 14 to each term inside the parentheses. In order to multiply a number times a fraction, we should first rewrite 14 as a fraction: $\frac{14}{1}$:

$$\frac{14}{1}\left(\frac{8}{7}+\frac{3}{14}\right) = \frac{14}{1}\left(\frac{8}{7}\right) + \frac{14}{1}\left(\frac{3}{14}\right) = \frac{14\times 8}{1\times 7} + \frac{14\times 3}{1\times 14}$$

Now notice that we have some common factors, so we shouldn't have to multiply everything out; we can avoid big numbers before they happen! On the first fraction, we can cancel a common factor of 7 from the top and bottom, and on the second fraction, we can cancel a common factor of 14: $\frac{{}^{2}\cancel{14}\times 8}{1\times \cancel{7}} + \frac{\cancel{14}\times 3}{1\times \cancel{14}} = \frac{2\times 8}{1} + \frac{3}{1} = 16 + 3 = 19.$

So, $14\left(\frac{8}{7}+\frac{3}{14}\right)$ = 19

Answer: **19**

3. 10(8.1 – 4.9) = ?

Distributing first, we get: 10(8.1 – 4.9) = 10(8.1) – 10(4.9) = 81 – 49. Now it's just a normal subtraction problem. Resist the urge to grab your calculator. If you were subtracting 81 – 50, you'd know the answer is 31, right? But we're not subtracting 50, we're only subtracting 49, so our answer should be 1 *more* than 31, which is 32.

81 – 49 = 32. This is good brain building stuff!

Answer: **32**

4. $10(8.1-\frac{1}{5})$ = ? *(Hint: if you do this correctly, it should be pretty easy)*

Distributing, we get: $10(8.1) - 10(\frac{1}{5}) = 81 - \frac{10}{1}(\frac{1}{5}) = 81 - \frac{10}{5} = 81 - 2 = 79.$ Voila!

So, $10(8.1-\frac{1}{5})$ = 79.

Aren't you glad we distributed first and didn't use PEMDAS, which would have told us to first combine 8.1 and $-\frac{1}{5}$? Well, *I'm* sure glad.

Answer: **79**

DTM from p.140

2. $5 - (h - 4)$

Alright, there's a sneaky -1 multiplying times that parentheses, so let's rewrite it and show where it is!

$5 + (-1)(h - 4)$

Now, distributing the –1 inside the parentheses, we get: $5 + (-1h) + 4$, but we can drop the 1, so: $5 + (-h) + 4$, Now we can combine the two constants, 5 and 4, so we get: $9 + (-h)$, or we could also write $9 - h$.

Answer: : **$9 + (-h)$**, or we could also write **$9 - h$**.

3. $10 - 3y(x - 4)$

Let's rewrite that first subtraction as "adding a negative" and we get:

$10 + (-3y)(x - 4)$

Now, distributing, we get: $10 + (-3yx) + 12y$. (try drawing in the arrows if it helps!)

We'll want to rearrange the middle term so that its variables are alphabetical: $-3xy$ instead of $-3yx$. There are no like terms to combine, so this is our answer:

Answer: **$10 + (-3xy) + 12y$**; you can also write **$10 - 3xy + 12y$**

4. $xy - 10\left(0.8 + \frac{xy}{10}\right)$

Alright, first we'll rewrite the subtraction as adding a negative, so it will be clearer that need to be distributing that negatives sign along with the $10x$:

$xy + (-10)\left(0.8 + \frac{xy}{10}\right)$

Now, distributing the (–10) to the added terms in the parentheses, (again, draw or imagine the arrows!) we get:

$xy + (-10)(0.8) + (-10)(\frac{xy}{10})$

The middle term will become –8, so now the expression looks like this:

$xy + (-8) + (-10)(\frac{xy}{10})$

Now, order to multiply the last term, we'll want to rewrite –10 as a fraction: $-10 = -\frac{10}{1}$,

so we can multiply: $(-\frac{10}{1})(\frac{xy}{10}) = -\frac{10 \cdot xy}{1 \cdot 10}$.

Notice that the 10's will cancel: $-\frac{\cancel{10} \cdot xy}{1 \cdot \cancel{10}} = -xy$. (don't forget about the negative sign!)

So, our full expression now looks like: $xy + (-8) + -xy$. And lookie there! The two variable terms will combine to result in 0, and we are left with: –8.

Isn't that something? $xy + (-10)\left(0.8 + \frac{xy}{10}\right) = -8$.

Answer: **–8**

5. $8ab - a\left(b - \frac{1}{a} + 3\right)$

Let's start by rewriting that first subtraction as adding a negative, so we can more clearly see what needs to get distributed: $8ab + (-a)\left(b - \frac{1}{a} + 3\right)$

Alright, time to distribute the $(-a)$ to each term inside the parentheses. Draw an arching arrow if it helps!

Our problem becomes: $8ab + (-a)(b) + (-a)(-\frac{1}{a}) + (-a)(3)$

Simplifying, and writing the middle "-a" as a fraction for multiplication purposes, we get:

$8ab + (-ab) + (-\frac{a}{1})(-\frac{1}{a}) + (-3a)$

Right away, we can see that the first two terms are like terms; let's combine them and get: $8ab + (-ab) = 7ab$. Let's also notice that the middle term has two negative signs multiplied together, so they will cancel out (we could have taken care of this at the distribution stage, too), so we can get rid of those negative signs: $(-\frac{a}{1})(-\frac{1}{a}) = \frac{a \times 1}{1 \times a}$, and since the a's will cancel on top and bottom as a common factor, all that's left of this term is 1! So our whole expression now looks like this:

$7ab + 1 + (-3a)$

Notice that there is nothing we can do to combine any more terms; there are no more like terms left, since the variable parts are different. You can write you answer any way you want, but people usually write the constant last:

$7ab + (-3a) + 1$

Answer: **$7ab + (-3a) + 1$**; you can also write **$7ab - 3a + 1$**