Solution Guide for Chapter 11

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

DTM from p.149

2. $2x - 1 = 0$

That equals sign verb ("is equals to" or "equals") certainly means that this is a math sentence; it's an equation! We can translate this into English like this: "Twice *x* minus 1, equals zero." Another option is, "One less than twice *x* is equal to zero." Or even: "One less than two times *x* equals zero." You get the idea. ☺

Answer: a. **Yes, this is a math sentence; it's an equation.**

b. Here are some options: **"Two times x, minus one, equals zero." "Twice x minus 1 equals zero." "One less than twice x equals zero." "One less than two times x equals zero."**

3. $\frac{y}{3} + 3 + x$

There is no math verb here, so it doesn't tell us anything about the relationship between these values. But we can still *translate* this fragment.

Answer: a. **No, this is not a math sentence.** b. **"One third of *y*, plus three, plus *x*"**

4. $a \geq 2$

This has a math verb: "≥" means "is greater than or equal to", so it is a math sentence. We can translate it like this: "*a* is greater than or equal to 2."

Answer: a. **Yes, this is a math sentence.** b. ***"a* is greater than or equal to two."**

5. $g + 0$

There is no math verb here, so it is not a sentence. So it's just an expression. Remember, the "+" just combines two things together, it doesn't tell us any information about the values involved.

Answer: a. **No, this is not a math sentence, it's just an expression.** b. **"g plus zero"**

6. $\frac{z}{3} < 7$

There is a math verb here: "< " means "is less than", so it is a math sentence, in fact, it's an inequality!

Answer: a. **Yes, this is a math sentence; it's an inequality.** b. **"One third of *z* is less than seven."**

DTM from p.150-1

2. Seven is less than twice *x*

"Seven is less than twice *x*," yep, there's the verb! So it will be a math sentence; in fact, "is less than" means it will be an inequality. "Twice x" means 2x, so let's translate the whole thing now: "7 < 2x." done!

Answer: a. **This is an inequality**. b. **7 < 2x**

3. 13 is greater than triple *c*

"13 is greater than triple *c*," yep, there's the verb! So it will be a math sentence; in fact, "is greater than" means it will be an inequality. "Triple *c*" means 3*c*, so let's translate the whole thing now: 13 > 3*c*

Answer: a. **This is an inequality**. b. **13 > 3*c***

4. 12 greater than triple *c*

Look carefully, there's no verb here! So, if you see "greater" with no verb, it means that we'll be adding something, right? We know that "triple *c*" means 3*c*, so if we have 12 greater than 3*c*, in other words, 12 more than 3*c*, we'd have this:

3c + 12, or you could write 12 + 3*c*

Answer: a. **This is just an expression. b. 3*c* + 12, or 12 + 3*c***

5. 5 less than half of *y*

Again, I see no verb here! So, what's half of y? It's $\frac{y}{2}$, right? And what's 5 less than that? It would be $\frac{y}{2} - 5$.

Answer: a. **This is just an expression.** b. $\boldsymbol{\frac{y}{2} - 5}$

6. 7 is more than one fourth of *w*

"7 is more than one fourth of *w*." There's a verb! "is more than" means that it will be an inequality, and we'll use ">". What's one fourth of *w*? It would be: $\frac{w}{4}$, so the whole expression would be: $7 > \frac{w}{4}$

Answer: a. **This is an inequality**. b. $\mathbf{7 > \frac{w}{4}}$

7. 8 more than one-third of *x* is 11

"8 more than one-third of *x* is 11," There is a sneaky verb in there. This phrase has the words "more than", but they're next to the verb – so don't be fooled into thinking this is an inequality, because it isn't! The "is" just represents good 'ol equality, so we'll use the "=" symbol in this math sentence. What's one-third of *x*? It's $\frac{x}{3}$. What's 8 more than that? It's $\frac{x}{3} + 8$, right? So the whole thing translates to: $\frac{x}{3} + 8 = 11$.

Answer: a. **This is an equation.** b. $\mathbf{\frac{x}{3} + 8 = 11.}$

DTM from p.154-6

2. After doubling the money in her bank account, Trudy spent $5 on music downloads. Let *s* = the money (in dollars) she started out with. Write an expression for how many dollars she has now.

Okay, so if "*s*" is the amount of money she started out with, then here's what happened: First she doubled the money, 2*s*, and then she spent 5 dollars, so she must have 2s – 5 dollars left!

Answer: **She has "2*s* – 5" dollars now.**

3. A fraction is $\frac{1}{4}$ of $\frac{4}{5}$.

Well "a fraction" is what we don't know, so let's call that "*f*." Translating the sentence word for word, and remembering that "is" means "=", and "of" means multiplication when it's immediately surrounded by two numbers (which it is here), then we get: $f = (\frac{1}{4})(\frac{4}{5})$. We could also write it like this: $f = \frac{1}{4} \times \frac{4}{5}$. This one's easy to finish up; multiplying across, we get: $\frac{1 \times 4}{4 \times 5} = \frac{1}{5}$.

Answer: $\boldsymbol{f = \frac{1}{4} \times \frac{4}{5}}$ **or** $\boldsymbol{f = (\frac{1}{4})(\frac{4}{5})}$. And by the way, $\frac{1}{4}$ of $\frac{4}{5} = \frac{1}{5}$

4. Brittany loves frozen red grapes – they taste like candy! She has a whole bowl of them. She eats five frozen grapes and then shares the rest equally among herself, and her 5 friends – Anne, Nicole, Aliza, Paul, and Kirsten. Let *s* = the number of grapes she started out with. Write an expression for how many Nicole got. *(Hint: this is very similar to #1.)*

So, if she started out with *s* frozen grapes, what's the first thing that happens to them? She eats 5 of them! So, at that point she has "*s* – 5" grapes, right? Next, she shares them equally with herself and 5 friends, which means she divides the frozen grapes into 6 equal portions, right? So if we divide "*s* – 5" by 6, we get: $\frac{s-5}{6}$

Answer: **Each friend got $\frac{s-5}{6}$ frozen grapes.**

5. Chris had way too many text messages on his phone, and wanted to clear them out. He first deleted 10 text messages, but he still had way too many, so he deleted half of what was left. Let *s* = the number of text messages he started out with. Write an expression for how many text messages are in his phone now.

So, if Chris started out with s text messages, and first deleted 10 messages, then at that point he'd have "s – 10" messages, right? And then what is half of that? We need to divide "s – 10" by 2, so we get: $\frac{s-10}{2}$

Answer: **Chris now has $\frac{s-10}{2}$ text messages.**

6. Sarah had a lot of ringtones in her phone yesterday. But she kept adding to them, and today, she has 9 more than twice what she started out with! Let *y* = number of ringtones she had yesterday. Write an expression for how many she has now.

So, if Sarah had y ringtones in her phone yesterday. What is "9 more than twice *y*"?

Twice $y = 2y$, so 9 more than *that* would be: $2y + 9$.

Answer: **Sarah has $2y + 9$ ringtones now**.

7. Suzanne works at a pet store. During the morning of her last day working there, she had lots of puppies sitting in the playpen. By the end of the day, she'd sold $\frac{4}{5}$ of them. Of those remaining, she took 2 home to keep for herself. Let m = the number of puppies she had in the morning. Write an expression for how many are left in the store after Suzanne goes home. *(Hint: do this one step at a time!)*

Okay, so if she had m puppies in the morning, then by the end of the day, she had sold 4/5 of m puppies, right? So that's equal to: $\frac{4}{5} \times m$. That's an expression for how many puppies were sold. Well, if $\frac{4}{5}$ of the puppies were sold, then how many are left at the store? That would be $\frac{1}{5}$ of m, right? So that expression is this: $\frac{1}{5} \times m$. But right before she left for the day, she took 2 puppies home with her! So, now how many puppies are at the store? That would be: $(\frac{1}{5} \times m) - 2$.

We could also write this as: $\frac{1}{5}m - 2$, or even $\frac{m}{5} - 2$. They mean the same thing!

Answer: **After Suzanne goes home, there are $\frac{1}{5}m - 2$ puppies left at the store.**