



## Solution Guide for Chapter 2

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

### DTM from p.27

2.  $-39 + (39 + 58) = ?$

The only operation here is addition (that negative sign is not subtraction, it’s just a negative number), so we use the associative property of addition, and shift the parentheses over, to make this problem easier:  $(-39 + 39) + 58$ . The inside of the parentheses now equals 0, so we’re left with 58.

Answer: **58**

3.  $(9 \times 2) \times 5 = ?$

Since the only operation here is multiplication, we can use the associative property of multiplication to regroup the terms like this:  $9 \times (2 \times 5)$ . The inside of the parentheses equals 10, and  $9 \times 10 = 90$ , easy!

Answer: **90**

4.  $3 \times \left(\frac{1}{3} \times 8\right) = ?$

Since the only operation in this expression is multiplication, we can use the associative property of multiplication to regroup the terms like this:  $\left(3 \times \frac{1}{3}\right) \times 8$ . Since the inside of the parentheses now equals 1, our problem becomes  $1 \times 8 = 8$ .

(The inside of the parentheses equals 1, because  $3 \times \frac{1}{3} = \frac{3}{1} \times \frac{1}{3} = \frac{3 \times 1}{1 \times 3} = \frac{3}{3} = 1$ .)

Answer: **8**

### DTM on p.28

2.  $7 + (2 + 1)$  and  $(7 + 2) + 1$

The only operation is addition, so yes, the associative property of addition applies, and tells us that the two expressions are indeed equal to each other. In fact, they both equal 10.

Answer: a. **yes**; b. **10**

3.  $(6 - 2) + 4$  and  $6 - (2 + 4)$

This almost looks like the associative property of addition, but there's subtraction involved! Nope, no associative property makes them equal. Let's evaluate them. We always follow the Panda rule (see p.21) so for  $(6 - 2) + 4$ , we start inside the parentheses and get:  $(6 - 2) + 4 \rightarrow 4 + 4 \rightarrow 8$ . For the second one, we get:  $6 - (2 + 4) \rightarrow 6 - 6 = 0$ .

Answer: a. **Nope, not equal**; b. **8 and 0**

4.  $5 \times (\frac{1}{2} \times 6)$  and  $(5 \times \frac{1}{2}) \times 6$

the only operation is multiplication, so yes, it applies, and tells us that the two sides are equal. the one on the left is easier to simplify:  $5 \times (\frac{1}{2} \times 6)$ . Inside the parentheses, we get

$\frac{1}{2} \times 6 = 3$ , so the expression simplifies to:  $5 \times 3 = 15$ .

Answer: a. **yes**; b. **15**

5.  $6 + (2 \times 3)$  and  $(6 + 2) \times 3$

Here, we have both addition and multiplication, so neither of the associative properties can tell us that they are equal – they are not equal! Let's do the first one:  $6 + (2 \times 3)$ .

PEMDAS tells us to first simplify inside the parentheses (it equals 6), so our problem becomes:  $6 + 6 = 12$ . For the second expression, PEMDAS also tells us to start inside the parentheses, and we get 8. So our problem becomes:  $8 \times 3 = 24$ .

Answer: a. **nope, not equal** b. **12 and 24**

6.  $(8 \div 2) \div 2$  and  $8 \div (2 \div 2)$

There is no associative property for division! Nope, the two expressions will not be equal.

Let's evaluate the first one:  $(8 \div 2) \div 2$ . PEMDAS tells us to first deal with the parentheses, so we get:  $8 \div 2 = 4$ , and our problem becomes:  $4 \div 2 = 2$ .

For the second expression, we also must deal with the inside of the parentheses first, and we get:  $2 \div 2 = 1$ . So our problem becomes  $8 \div 1 = 8$ .

Answer: a. **nope, not equal**; b. **2 and 8**

**DTM from p.33-34**

2.  $(-18.5 + y) + 8.5$

Since the only operation is addition, we can apply both the commutative and associative properties of addition to this baby. What would be most helpful? We'd like to get those numbers together. First, we'll use the commutative property of addition to switch the order of the terms inside the parentheses, so the problem becomes:  $(y + [-18.5]) + 8.5$ , (remember, you can *always* add parentheses or brackets to separate out negative numbers!) and then we use the associative property of addition to shift over the parentheses:  $y + ([-18.5] + 8.5)$ . now, dealing with the inside of the parentheses, we can combine  $[-18.5] + 8.5$  (we can easily drop these brackets now)  $= -18.5 + 8.5 = -10$ . So the entire expression has become:  $y + (-10)$ . You can also write this as  $y - 10$ .

Answer:  **$y + (-10)$  or  $y - 10$**

3.  $(-18.5 \div y) + 1.5$

This may look tempting, but you cannot use any associative or commutative property with this, because there is division. Remember, you can only use the properties if your expression has **ONLY** addition or **ONLY** multiplication.

Answer: **not allowed**

4.  $7 \times (z \times \frac{1}{7})$

since there is only multiplication here, we can use the properties! Let's get those numbers together, by first using the commutative property of multiplication to switch the order of

the terms *inside* the parentheses:  $(\frac{1}{7} \times z)$ , so the expression looks like this:  $7 \times (\frac{1}{7} \times z)$ ,

and now we use the associative property of multiplication to move the parentheses

themselves, and rewrite the problem like this:  $(7 \times \frac{1}{7}) \times z$ . Since the inside of the

parentheses equals 1, our problem becomes:  $1 \times z = z$ .

Answer:  $z$