

G4-M3-Lesson 23

1. Explain your thinking, or use division to answer the following.

<p>Is 2 a factor of 96?</p> <p><i>Yes. 96 is an even number. 2 is a factor of every even number.</i></p>	<p>Is 3 a factor of 96?</p> $\begin{array}{r} 32 \\ 3 \overline{)96} \\ \underline{-9} \\ 06 \\ \underline{-6} \\ 0 \end{array}$ <p><i>Yes, 3 is a factor of 96. When I divide 96 by 3, my answer is 32.</i></p>
<p>Is 4 a factor of 96?</p> $\begin{array}{r} 24 \\ 4 \overline{)96} \\ \underline{-8} \\ 16 \\ \underline{-16} \\ 0 \end{array}$ <p><i>Yes, 4 is a factor of 96. When I divide 96 by 4, my answer is 24.</i></p>	<p>Is 5 a factor of 96?</p> <p><i>No, 5 is not a factor of 96. 96 does not have a 5 or 0 in the ones place. All numbers that have a 5 as a factor have a 5 or 0 in the ones place.</i></p>

I use what I know about factors to solve. Thinking about whether 2 is a factor or 5 is a factor is easy. Threes and fours are harder, so I divide to see if they are factors. 96 is divisible by both 3 and 4, so they are both factors of 96.

2. Use the associative property to find more factors of 28 and 32.

a. $28 = 14 \times 2$

$$= (7 \times 2) \times 2$$

$$= 7 \times (2 \times 2)$$

$$= 7 \times 4$$

$$= 28$$

b. $32 = 8 \times 4$

$$= (2 \times 4) \times 4$$

$$= 2 \times (4 \times 4)$$

$$= 2 \times 16$$

$$= 32$$

I find more factors of the whole number by breaking down one of the factors into smaller parts and then associating the factors differently using parentheses.

3. In class, we used the associative property to show that when 6 is a factor, then 2 and 3 are factors, because $6 = 2 \times 3$. Use the fact that $12 = 2 \times 6$ to show that 2 and 6 are factors of 36, 48, and 60.

$$36 = 12 \times 3$$

$$= (2 \times 6) \times 3$$

$$= 2 \times (6 \times 3)$$

$$= 2 \times 18$$

$$= 36$$

$$48 = 12 \times 4$$

$$= (2 \times 6) \times 4$$

$$= 2 \times (6 \times 4)$$

$$= 2 \times 24$$

$$= 48$$

$$60 = 12 \times 5$$

$$= (2 \times 6) \times 5$$

$$= 2 \times (6 \times 5)$$

$$= 2 \times 30$$

$$= 60$$

I rewrite the number sentences, substituting 2×6 for 12. I can move the parentheses because of the associative property and then solve. This helps to show that both 2 and 6 are factors of 36, 48, and 60.

4. The first statement is false. The second statement is true. Explain why using words, pictures, or numbers.

If a number has 2 and 8 as factors, then it has 16 as a factor.

If a number has 16 as a factor, then both 2 and 8 are factors.

The first statement is false. For example, 8 has both 2 and 8 as factors, but it does not have 16 as a factor. The second statement is true. Any number that can be divided exactly by 16 can also be divided by 2 and 8 instead since $16 = 2 \times 8$. Example: $2 \times 16 = 32$

$$2 \times (2 \times 8) = 32$$

I give examples to help with my explanation.