Name _____ Date _____

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

a. Is 2 a factor of 84?

Yes. 84 is an even number. 2 is a factor of every even number.

$$2\overline{)84}\quad 42,\ -8,\ 04,\ -4,\ 0$$

b. Is 2 a factor of 83?

No. 83 is an odd number. 2 is not a factor of odd numbers.

$$2\overline{)83}\quad 41\ R1,\ -8,\ 03,\ -2,\ 1$$

c. Is 3 a factor of 84?

Yes.

$$3\overline{)84}\quad 28,\ -6,\ 24,\ -24,\ 0$$

d. Is 2 a factor of 92?

Yes. 92 is an even number.

$$2\overline{)92}\quad 46,\ -8,\ 12,\ -12,\ 0$$

e. Is 6 a factor of 84?

Yes.

$$6\overline{)84}\quad 14,\ -6,\ 24,\ -24,\ 0$$

f. Is 4 a factor of 92?

Yes.

$$4\overline{)92}\quad 23,\ -8,\ 12,\ -12,\ 0$$

g. Is 5 a factor of 84?

No. 84 does not have a 5 or 0 in the ones place. All numbers that have 5 as a factor have a 5 or 0 in the ones place.

$$5\overline{)84}\quad 16\ R4,\ -5,\ 34,\ -30,\ 4$$

h. Is 8 a factor of 92?

No.

$$8\overline{)92}\quad 11\ R4,\ -8,\ 12,\ -8,\ 4$$

2. Use the associative property to find more factors of 24 and 36.

a. $24 = 12 \times 2$

$= (\underline{4} \times 3) \times 2$

$= \underline{4} \times (3 \times 2)$

$= \underline{4} \times 6$

$= \underline{24}$

b. $36 = \underline{9} \times 4$

$= (\underline{3} \times 3) \times 4$

$= \underline{3} \times (3 \times 4)$

$= \underline{3} \times 12$

$= \underline{36}$

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 $8 = 4 \times 2$ to show that 2 and 4 are factors of 56, 72, and 80.

$56 = 8 \times 7$

$= (4 \times 2) \times 7$

$= 4 \times (2 \times 7)$

$= 4 \times 14$

$= 56$

$72 = 8 \times 9$

$= (4 \times 2) \times 9$

$= 4 \times (2 \times 9)$

$= 4 \times 18$

$= 72$

$80 = 8 \times 10$

$= (4 \times 2) \times 10$

$= 4 \times (2 \times 10)$

$= 4 \times 20$

$= 80$

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

(1) If a number has 2 and 4 as factors, then it has 8 as a factor.

(2) If a number has 8 as a factor, then both 2 and 4 are factors.

(1)

$$\begin{array}{r} 14 \\ 2\overline{)28} \\ -2 \\ \hline 08 \\ -8 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 7 \\ 4\overline{)28} \\ -28 \\ \hline 0 \end{array}$$

$4 \times 7 = 28$

$$\begin{array}{r} 3\ R4 \\ 8\overline{)28} \\ -24 \\ \hline 4 \end{array}$$

$2 \times 14 = 28$

28 has 2 and 4 as factors but not 8.

(2) Any number that can be divided exactly by 8 can also be divided by 2 and 4 instead since $2 \times 4 = 8$.

Example: $8 \times 5 = 40$

$(4 \times 2) \times 5 = 40$