Name_____ Group_____ Ms. Barbalaco (Turquoise)
Date_____

STUDY GUIDE:

-Factors
-Multiples
-Prime Numbers
-Composite Numbers
-Square Numbers

-Common Multiples
-Common Factors
-Least Common Multiple (LCM)
-Whole Numbers

-Greatest Common Factor (GCF)
-Distributive Property
-Exponents
-Order of Operations

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1. A whole number is: NOT a ___decimal___, ___fraction___ or ___negative number___.

2. Write next to each number whether it is prime or composite. Then, list its factors.

Number	Prime or Composite?	Factors
a. 14	Composite	1, 2, 7, 14
b. 33	Composite	1, 3, 11, 33
c. 23	Prime	1, 23
e. 56	composite	1, 2, 4, 7, 8, 14, 28, 56

3. Name the proper factors of the following numbers.

Proper Factor
Any factor less than itself.

Number	Proper Factors
a. 17	I only because it's prime.
b. 16	1, 2, 4, 8
c. 25	1, 5
d. 24	1, 2, 3, 4, 6, 8, 12

Square Numbers (pointing to b. 16 and c. 25)

4. A manager turns on the restaurant's two neon signs at the same time. Both signs blink as they are turned on. One sign blinks every 20 seconds and the other blinks every 15 seconds. In how many seconds will they blink together again? LCM

20, 40, (60)
15, 30, 45, (60)

[60 seconds]

OR

5 | 20   15
    4   3

5 · 4 · 3
20 · 3
[60] sec.

5. The school has 72 pencils and 54 erasers that they are putting into boxes. What is the greatest number of boxes there could be if there are the same amount of pencils and erasers in each box? GCF

$72: 1, 2, 3, 4, 6, 8, 9, 12, \underline{18}, 24, 36, 72$

$\boxed{18 \text{ Boxes}}$

$54: 1, 2, 3, 6, 9, \underline{18}, 27, 54$

$\begin{array}{c|cc} 2 & 72 & 54 \\ 3 & 36 & 27 \\ 3 & 12 & 9 \\ & 4 & 3 \end{array}$

OR

$2 \cdot 3 \cdot 3$
$6 \cdot 3$
$\boxed{18} \text{ Boxes}$

6. Find the least common multiple (LCM) of the following pairs:

a) 24 and 36

$24: 24, 48, \boxed{72}$
$36: 36, \boxed{72}, 108$

OR

$\begin{array}{c|cc} 2 & 24 & 36 \\ 3 & 12 & 18 \\ 2 & 4 & 6 \\ & 2 & 3 \end{array}$

$2 \cdot 3 \cdot 2 \cdot 2 \cdot 3$
$6 \cdot 4 \cdot 3$
$24 \cdot 3$
$\boxed{72}$

b) 20 and 25

$20: 20, 40, 60, 80, \boxed{100}$
$25: 25, 50, 75, \boxed{100}$

OR

$\begin{array}{c|cc} 5 & 20 & 25 \\ & 4 & 5 \end{array}$

$5 \cdot 4 \cdot 5$
$20 \cdot 5$
$\boxed{100}$

c) 42 and 14

$42: \boxed{42}$
$14: 14, 28, \boxed{42}$

OR

$\begin{array}{c|cc} 2 & 42 & 14 \\ 7 & 21 & 7 \\ & 3 & 1 \end{array}$

$2 \cdot 7 \cdot 3 \cdot 1$
$14 \cdot 3 \cdot 1$
$42 \cdot 1$
$\boxed{42}$

7. Find the greatest common factor (GCF) of the following pairs:

a) 18 and 30

$18: 1, 2, 3, \boxed{6}, 9, 18$

$30: 1, 2, 3, 5, \boxed{6}, 10, 15, 30$

OR

$\begin{array}{c|cc} 3 & 18 & 30 \\ 2 & 6 & 10 \\ & 3 & 5 \end{array}$

$3 \cdot 2 = \boxed{6}$

b) 49 and 14

$49: 1, \boxed{7}, 49$

$14: 1, 2, \boxed{7}, 14$

OR

$\begin{array}{c|cc} 7 & 49 & 14 \\ & 7 & 2 \end{array}$

c) 32 and 64

$32: 1, 2, 4, 8, 16, \boxed{32}$

$64: 1, 2, 4, 8, 16, \boxed{32}, 64$

OR

$\begin{array}{c|cc} 2 & 32 & 64 \\ 2 & 16 & 32 \\ 2 & 8 & 16 \\ 2 & 4 & 8 \\ 2 & 2 & 4 \end{array}$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
$4 \cdot 4 \cdot 2$
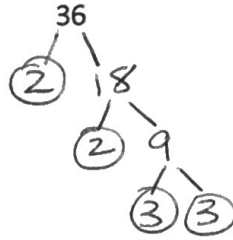$16 \cdot 2$
$\boxed{32}$

A. Write the prime factorization of the following numbers:
   (in BOTH expanded & exponential forms)

1)
                                        36
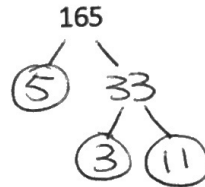
$2 \cdot 2 \cdot 3 \cdot 3$

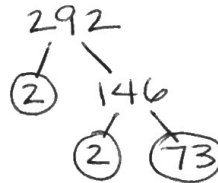Expanded form

$2^2 \cdot 3^2$

Exponential form

2)
                                        165

$5 \cdot 3 \cdot 11$

Expanded form

$5 \cdot 3 \cdot 11$

Exponential form

3)
                                        292

$2 \cdot 2 \cdot 73$

Expanded form

$2^2 \cdot 73$

Exponential form

Extra credit Question:
What is Mrs.B's
favorite thing to
do in the Fall?

B. Identify which form the expression is of the distributive property, write the other form and show that they are equivalent for the following problems:

1) Form: __Factored__   Expanded
                              ↓
$$2(6+5) \qquad = \underline{2(6) + 2(5)}$$
$$2(11) \qquad\quad = 12 + 10$$
$$22 \qquad\qquad = 22 ✓$$
$$\text{Equivalent!}$$

2) Form: __Expanded__   Factored
                              ↓

Extra credit Answer:
Mrs. B's favorite thing
to do in the fall is
to see the leaves
change, go apple
picking & eat any
dessert with pumpkin!

$$4(8)+4(3) \qquad = \underline{4(8+3)}$$
$$32 + 12 \qquad\quad = 4(11)$$
$$44 \qquad\qquad = 44 ✓$$
$$\text{Equivalent!}$$

...ns to simplify the following expressions:

1)
$$28 - 2^3 \cdot 3 \div 2 + 2$$
$$28 - 8 \cdot 3 \div 2 + 2$$
$$28 - 24 \div 2 + 2$$
$$28 - 12 + 2$$
$$16 + 2$$
$$\boxed{18}$$

R
E✓
M✓D✓
A✓S✓

2^3
$2 \cdot 2 \cdot 2$
$4 \cdot 2$
8

__Remember__
Expressions do __NOT__ have
equal signs!

2)
$$12 \cdot 4 - 2(6+4) + 3^2 - 3(2)$$
$$12 \cdot 4 - 2(10) + 3^2 - 3(2) \quad P✓$$
$$12 \cdot 4 - 2(10) + 9 - 3(2) \quad E✓$$
$$48 - 2(10) + 9 - 3(2) \, M✓D̸$$
$$48 - 20 + 9 - 3(2) \quad A✓S✓$$
$$48 - 20 + 9 - 6$$
$$28 + 9 - 6$$
$$37 - 6$$
$$\boxed{31}$$

D. Write an expression to solve the word problem and solve the problem:
Ms. Barbalaco is planning a class trip to Six Flags Frightfest. It costs $14 per student. She is going to bring 12 students from one class and 16 from another class. What is the total cost of the trip for the Ms. Barbalaco for bringing all the students?

Expression → $\$14(12) + \$14(16)$ OR $\$14(12+16)$
$$168 + 224 \qquad\qquad \$14(28)$$
$$\$392 \qquad\qquad\qquad \$392$$

total
cost

14
$\cdot 12$
28
14
$\overline{168}$

14
$\cdot 16$
84
14
$\overline{224}$

168
$+224$
$\overline{392}$

14
$\cdot 28$
112
280
$\overline{392}$