FACTORS

Factors are the numbers we multiply to get another number.

Example: List all factors of 24.

1 24, 2 12, 3 8, 4 6
The factors of 24 are: 1, 2, 3, 4, 6, 8, 12, 24.

EXERCISES:

3. List all factors of the following numbers.

a) 12 b) 80 c) 36 d) 45 e) 99

PRIME FACTORIZATION

A prime number is a whole number greater than 1 whose factors are only 1 and itself.
Prime numbers = {2, 3, 5, 7, 11, 13, ...}

Prime factorization of a number is to factor a number completely until only prime numbers are left. A factor tree is helpful when finding the prime factorization.

To find the prime factorization:
Start with any two factors of the number.
Keep factoring until all branches end with prime numbers.
The prime factorization is the product of prime numbers.

Example: Find the prime factorization of 90.

From the factor tree to the right, we see that at the end of each branch we have: [ ]

EXERCISES:

4. Find the prime factorization of the following numbers:

a) 75 b) 66 c) 40 d) 81 e) 54

REDUCING A FRACTION TO LOWEST TERMS

EXERCISES:

5. Reduce each fraction to lowest terms.

a) — b) — c) — d) — e) —

DIVIDING FRACTIONS

When dividing fractions, multiply the first fraction by the reciprocal ("flip") of the second fraction.

_ _ _ _

Example: Divide these fractions. Simplify, if possible.

EXERCISES:

7. Divide. Simplify, if possible.

a) _ _ b) _ _ c) _ — d) _ e) _ _

EXERCISES:

8. Find the least common denominator of each set of fractions.

a) – – b) – – c) – – d) – –

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ADDING AND SUBTRACTING FRACTIONS

To add or subtract fractions, both fractions must have the same denominator. If they do not have the same denominator, find the LCD and write each fraction as an equivalent fraction with the LCD. Once all fractions have the same denominator, add or subtract the numerators and keep the common denominator. Always check if we can reduce further!

Note: A whole number can be written as a fraction. (Example: 3 = –)

Example: Add or subtract.

a) – – (same denominator) b) — – (different denominator; LCD = 15)

– – —— – — — — — —— — –

Always reduce to lowest terms, if possible.

EXERCISES:

10. Add or subtract.

a) – – b) – – c) – – d) – e) – –

ORDER OF OPERATIONS

PE(MD)(AS)

1. Parenthesis or other grouping symbols [ ], { }, | |. Start with the innermost parenthesis then work our way towards the outer grouping symbols.
2. Exponents
3. Multiplication OR Division [LEFT TO RIGHT!]
4. Addition OR Subtraction [LEFT TO RIGHT!]

Example: Simplify.

EXERCISES:

11. Simplify.

a) b) c)

d) e)

Answers:

1. a. – b. – c. – d. – e. –

2.

3. a. 1, 2, 3, 4, 6, 12
   b. 1, 2, 4, 5, 8, 10, 16, 20, 40, 80
   c. 1, 2, 3, 4, 6, 9, 12, 18, 36
   d. 1, 3, 5, 9, 15, 45
   e. 1, 3, 9, 11, 33, 99

4. a. b. c. d.
   e.

5. a. –b. – c. – d. – e. —

6. a. –b. — c. — d. – e. –

7. a. –b. c. – d. 12 e. —

8. a. 15 b. 8 c. 35 d. 4 e. 16

9. a. 10