

### SIMPLIFYING FRACTIONS / EVALUATING EXPONENT EXPRESSIONS

**Write the fractions and mixed numbers in lowest terms.**

1.	2.	3.	4.
5.	6.	7.	8.

**Multiply these fractions.**

9. ·	10. ·	11. ·
12. ·	13. ·	14. ·

**Add or subtract the fractions.**

- |                 |                  |                   |
|-----------------|------------------|-------------------|
| 15. $37 + 27$   | 16. $79 - 19$    | 17. $712 - 412$   |
| 18. $711 + 411$ | 19. $1116 + 416$ | 20. $5060 - 2060$ |

**Expand the exponent expression.**

- |             |             |             |                   |
|-------------|-------------|-------------|-------------------|
| 21. $2^4 =$ | 22. $5^3 =$ | 23. $x^2 =$ | 24. $5^2x^3y^4 =$ |
|-------------|-------------|-------------|-------------------|

**Evaluate the expression for the given value of the variable.**

25. $q^3$ when $q = 10$	26. $b^5$ when $b = 2$	27. $z^2$ when $z = 5$
28. $x^4$ when $x = 6$	29. $m^3$ when $m = 9$	30. $n^5$ when $n = 3$

**Simplify the expression, if possible.**

31.	32.
33.	34.

## MORE FRACTIONS / ORDER OF OPERATIONS

### Goal: Adding and Subtracting with Unlike Denominators

Before you can add fractions, they must have common *denominators*, or denominators that are alike. If the denominators are not all alike, you will need to raise the fractions to higher terms so that the denominators are the same. This new denominator is called the **least common denominator** (LCD).

*Show ALL work!*

Raising a fraction to higher terms = multiplying by 1.

Common denominator – common multiples of two or more denominators

Least common denominator – smallest denominator that is a multiple of two denominators

### **ADD OR SUBTRACT. ANSWER IN SIMPLEST FORM.**

1. _____	2. _____	3. _____
4. _____	5. _____	6. _____
7. _____	8. _____	9. _____

### Goal: Use the established order of operations

An established order of operations is used to evaluate an expression involving more than one operation.

1<sup>st</sup> – First do operations that occur within grouping symbols ( ), [ ], { }

2<sup>nd</sup> – Then evaluate powers (also known as exponents)

3<sup>rd</sup> – Then do multiplications and divisions from left to right

4<sup>th</sup> – Finally do additions and subtractions from left to right

*Show ALL work!*

### Example (Evaluate without Grouping Symbols)

Evaluate the expression  $3x^2 + 1$  when  $x = 4$ . Use the order of operations.

Evaluate the variable expression when  $x = 2$ . Use the order of operations.

1. $2x^2 + 5$	2. $8 - x^2$	3. $6 + 3x^2$	4. $20 - 4x^2$
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### Example 2 (Evaluate Expressions with Grouping Symbols)

Evaluate  $24 \div (6 \cdot 2)$ . Use the order of operations.

SOLUTION:  $24 \div (6 \cdot 2) = 24 \div 12$   
 $= 2$

Simplify  $6 \cdot 2$   
Evaluate the quotient

5. $(6 - 2)^2 - 1$	6. $30 \div (1 + 4) + 2$	7. $(8 + 4) \div (1 + 2) + 1$
8. $(30 \div 1) + (4 + 2)$	9. $6 - (2^2 - 1)$	10. $8 + 4 \div (1 + 2 + 1)$

**Goal: Multiply real numbers using the rules for the sign of a product.**

**Rule #1:** When multiplying or dividing two numbers, if the numbers have the same sign, the result is positive.

**Rule #2:** When multiplying or dividing two numbers, if the numbers have different signs (one “+”, one “-”), the result is negative.

Examples:

- $(4)(3) = 12$
- $(-4)(-3) = 12$                       *Same signs → “+” answer*
- $(-4)(3) = -12$
- $(4)(-3) = -12$                       *Different signs → “-” answer*

If you have more than two numbers, take it one step at a time using the rules above.

Examples:

- $(4)(-2)(6)$        $(4)(-2) = -8$   
 $(-8)(6)$            $(-8)(6)$   
 $-48$
- $(-3)(-2)(6)$        $(-3)(-2) = 6$   
 $(6)(6)$                $(6)(6) = 36$   
 $36$

Find the product or quotient.

11. $(-2)(3)$	12. $(-7)(-1)$	13. $(10)(-2)$
14. $(-3)(2)(-3)$	15. $(-4)(-2)(-5)$	16. $(6)(-6)(2)$
17.	18.	19.
20. $(5)(-w)$	21. $8(-t)(-t)$	22. $(-7)(-y)(-y)$
23. $(6x)$	24. $-4(a)(-a)(-a)$	25. $(-s)(10s)$
26. $-15x$ when $x = 3$	27. $2p^3$ when $p = -1$	28. $(-4m^2)(5m)$ when $m = -2$