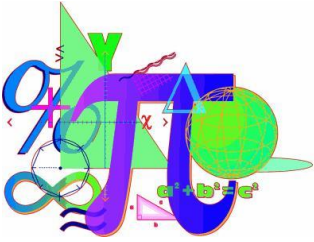


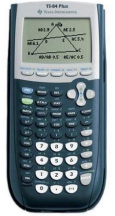
Name \_\_\_\_\_

8<sup>th</sup> Grade Teacher \_\_\_\_\_



# Watertown Public Schools

## Algebra 1 Skills Review Packet



This packet contains topics that you are expected to know prior to entering Algebra 1. You have learned these skills over the past few years. These examples focus on both mathematical skills and problem solving. This packet should be completed independently. Upon your completion, your parent/guardian needs to sign the packet.

If you are having a difficult time adding, subtracting, and multiplying numbers, we suggest you study this over the summer. For example, flashcards can be used to help you with basic facts. Also, you can do a Google search for more practice problems.

There are links to instructional videos from Khan Academy to help you remember some topics.

This skills review will help prepare you for the first assessment which will be about a week into the school year. *The packet is expected to be completed for the first day of class.*

**Please show your work in the packet.**

Parent/Guardian Signature: \_\_\_\_\_

Date \_\_\_\_\_

**Operations: Solve each and select the correct solution.**

1.  $5 - 3 * 7 + 4 \div 2$

- a. 9
- b. -14
- c. 16
- d. 20

2.  $-|-4| + 5$

- a. 9
- b. -1
- c. 1
- d. 20

3.  $-5 + 1 - 13$

- a. -17
- b. -7
- c. 7
- d. 9

4.  $20 + 12 - 7$

- a. 35
- b. -25
- c. 15
- d. 25

5.  $(2)(-4)(-5)(-1)$

- a. 40
- b. -40
- c. -8
- d. -41

6.  $|9 - (-5) + 8| - 2$

- a. -20
- b. -24
- c. 20
- d. 22

7.  $\frac{3}{4} + \frac{4}{5}$

- a.  $\frac{7}{9}$
- b.  $\frac{3}{5}$
- c.  $\frac{31}{20}$
- d.  $\frac{4}{3}$

8.  $-\frac{3}{4} * \frac{2}{7}$

- a.  $\frac{3}{14}$
- b.  $-\frac{3}{14}$
- c.  $\frac{21}{8}$
- d.  $-\frac{21}{8}$

9.  $-\frac{1}{3} \div \frac{3}{5}$

- a.  $-\frac{1}{5}$
- b.  $-\frac{5}{6}$
- c.  $-\frac{5}{9}$
- d. -5

## Order of Operations:

Online Tutorial: <https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-negative-numbers-multiply-and-divide/cc-7th-order-of-operations/v/introduction-to-order-of-operations>

**Example:** Order of Operations - PEMDAS

$$3^2(4 \cdot 6 \div 12) + 7$$

$$3^2(24 \div 12) + 7$$

$$3^2(2) + 7$$

$$9(2) + 7$$

$$18 + 7$$

$$25$$

10.  $(4 \cdot -7) + 6 \cdot 4 - 3$

11.  $-3(4 + 2 - 5)^2 + 18 \div 2$

12.  $(4 + 4 - 6)^3 - 18 \div 6 - 4$

13.  $4 + (-2 + 3)^2 - 5$

**Properties of Real Numbers - Make sure you are comfortable identifying these properties:**

- a.  $5 + -5 = 0$  Property of Opposites
- b.  $\frac{7}{2} \cdot \frac{2}{7} = 1$  Property of Reciprocals
- c.  $(4 + 2) + 6 = 4 + (2 + 6)$  Associative Property (with Addition)
- d.  $3(4 \cdot 5) = (3 \cdot 4) \cdot 5$  Associative Property (with Multiplication)
- e.  $10 + 2 = 2 + 10$  Commutative Property (with Addition)
- f.  $4 \cdot -3 = -3 \cdot 4$  Commutative Property (with Multiplication)
- g.  $5(1) = 5$  Multiplicative Identity
- h.  $8 + 0 = 8$  Additive Identity
- i.  $4(6 + 2) = 4(6) + 4(2)$  Distributive Property

### **Evaluating Expressions**

Online Tutorial: <https://www.khanacademy.org/math/algebra-basics/core-algebra-expressions/core-algebra-variables-and-expressions/v/expressions-with-two-variables>

**Example:** Evaluate  $15x$  when  $x = 4$ :

$$15(4) = 60$$

14. Evaluate  $w - 8$  when  $w = 20$ :

15. Evaluate  $2ab - 4b + 6$  when  $a = -3$  and  $b = 7$

a. Evaluate  $4x + 3a - 2(x - a)$  when  $a = 4$  and  $x = 5$

## Powers: Repeated multiplication

Online Tutorial: <https://www.khanacademy.org/math/algebra-basics/core-algebra-exponent-expressions/core-algebra-exponent-properties/v/exponent-properties-involving-products>

**Example:**  $4^5 = 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 1024$

16.  $7^3$

17.  $4^2 \cdot 2^5$

**Example:**  $b \cdot b \cdot b \cdot b = b^4$

18.  $jjjkjkj$

19.  $yyykkk$

## Evaluating Formulas

Online Tutorial: <https://www.khanacademy.org/math/algebra/introduction-to-algebra/variable-and-expressions/v/evaluate-a-formula-using-substitution>

**Example:** Use the formula  $A = lw$ , to find the area of a rectangle with length 7 and width 4.

$$A = lw = 7 \cdot 4 = 28$$

20. Use the formula  $F = 1.8C + 32$ , where  $C$  is degrees Celsius, and  $F$  is degrees Fahrenheit to calculate the temperature in Fahrenheit of a room that is  $60^\circ\text{C}$ .

21. The volume of a cylinder is found using the formula  $V = \pi r^2 h$ , where  $\pi = 3.14$ ,  $r$  is the radius of the base, and  $h$  is the height of the cylinder. Find the volume of a cylinder that is 8 inches tall, with a radius of 2 inches.

## Distributive Property

Online Tutorial: <https://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/distributive-property-with-rational-terms>

**Example:**  $3(2x - 5) = 3(2x) + 3(-5) = 6x + -15$

22.  $4(6 - 3j)$

23.  $(2x - 4)3$

24.  $-4x(2x - 5)$

25.  $2(4x + 5)$

26.  $-7(y - 5v)$

27.  $(6x + 8)3$

## Like terms: Parts of an expression with the same variable part

Online Tutorial: <https://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/combining-like-terms-1>  
and <https://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/combining-like-terms-3>  
and <https://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/combining-like-terms-and-the-distributive-property>

**Example:**  $4g + -6g = -2g$

$$28. 3x + 2k - 4x + 7k$$

$$29. y + 4 - 3x + 5 - 6y$$

$$30. 4x + 7y - 2x + 7y + x$$

$$31. 3x^3 + 2x - 4x^2 + 5x^3 + 7x$$

$$32. 6y^2 + 2 - 4y^2 + 7y + 5 + 8y - 9$$

Simplify the expression completely:

$$33. -3(4x - 5) + 2x + 7$$

$$34. 5 + 3x + 2(2x - 1)$$

$$35. 5(x + 3) + 2x + 3(2x - 6)$$

## Identifying Parts of Algebraic Expressions

Online Tutorial: <https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-parts-of-expressions/v/expression-terms-factors-and-coefficients>

36. Consider the following algebraic expression:

$$4x - 5v + 7x - 6 + 4x$$

Number of terms: \_\_\_\_\_

List coefficient(s): \_\_\_\_\_

List constant(s): \_\_\_\_\_

Circle the like terms

Simplify:

37. Consider the following algebraic expression:

$$6x + 2y - 5y + 3x + 11 - 4x$$

Number of terms: \_\_\_\_\_

List coefficient(s): \_\_\_\_\_

List constant(s): \_\_\_\_\_

Circle the like terms

Simplify: