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**Day 1 - Algebraic Expressions Practice**


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1. Complete the table.

| Expression             | List the Terms | List the Factors | List the Variables | List the Coefficients | List the Constants |
|------------------------|----------------|------------------|--------------------|-----------------------|--------------------|
| $3y^3 + 4y^2 - 7y + 1$ |                |                  |                    |                       |                    |
| $5x^4 - 9x^2$          |                |                  |                    |                       |                    |
| $-a^2 + 6a - 3$        |                |                  |                    |                       |                    |
| 15                     |                |                  |                    |                       |                    |

2. Write an expression with exactly 5 terms, containing the coefficients 7, 21, 15, and 8. (Answers will vary.)

3. Simplify each expression (hint: combine "like terms").

a.  $5f + 8 - 13f$

b.  $2x - 5x^2 + 3 + 4x$

c.  $3x^2 + 6x - 2y + 4x^2 + 3y - x$

d.  $3(2x - 4) + 2x$

e.  $-2(8y - 4) + 9y + 6$

f.  $\frac{13 + 2(7x - 3)}{7}$

4. Give an example of two like terms and two unlike terms. Explain why they would or would not be classified as like terms.LikeUnlike5. Describe the error in evaluating the expression when  $m = 8$ .

**X**  $5m + 3 = 5 \cdot 8 + 3$   
 $= 5 \cdot 11$   
 $= 55$

6. Evaluate the following expressions when  $a = 10$ ,  $b = 9$ , and  $c = 4$ .

a.  $a^2 - 18$

b.  $bc + 12.3$

c.  $3a + 2b - 6c$

7. The expression  $20a + 13c$  is the cost for  $a$  adults and  $c$  students to enter the science museum.

a. Find the total cost for 4 adults and 24 students.

b. You figure out the cost for the group, but then the number of adults and students in the group both double. Does the cost double? Explain your answer using an example.

c. In part A, the number of adults doubles, but the number of students is cut in half. Does the cost remain the same? Explain why or why not.

8. Stretch your thinking - Simplify the following expression:  $5(x - 4) - (2x - 7) + x - 2(x + 3)$

**Day 2 – Creating Algebraic Expressions**

For each word problem, show the work to how you arrived at your answer for parts A and B. Define the quantity that is changing each time in part C. Using your work, create an algebraic expression for part D.

1. *You buy 100 yo-yos to give away as prizes at a carnival.*

- If 12 people win a prize, how many yo-yos will you have left?
- How many yo-yos will you have if 34 people win a prize?
- What quantity is changing each time? What variable will you use to represent this quantity?
- Write an expression to represent the scenario.

2. *Bulk trail mix costs \$1.95 per pound.*

- If you purchase 4 pounds of trail mix, how much will that cost?
- If you purchase 7 pounds of trail mix, how much will that cost?
- What quantity is changing each time? What variable will you use to represent this quantity?
- Write an expression to represent the scenario.

3. *The charge for ice skating is \$3 for the skate rental and \$2 per hour to skate.*

- How much will you pay for 4 hours of skating?
- How much will you pay for  $5\frac{1}{2}$  hours of skating?
- What quantity is changing each time? What variable will you use to represent this quantity?
- Write an expression to represent the scenario.

4. *You have \$15 to spend at the snack bar. All of the snacks at the snack bar cost \$1.50 each.*

- How much money will you have left if you buy 3 snacks?
- How much money will you have left if you buy 6 snacks?
- What quantity is changing each time? What variable will you use to represent this quantity?
- Write an expression to represent the scenario.

5. *Atlanta City Cab charges \$3.30 as an initial fee the minute the customer enters the cab. The company then charges \$2.40 per mile.*

- How much will it cost to ride if the cab travels 10 miles?
- How much will it cost to ride if the cab travels 13.5 miles?
- What quantity is changing each time? What variable will you use to represent this quantity?
- Write an expression to represent the scenario.

6. *Caitlin has \$200 in her savings account. She withdraws \$15 each week.*

- How much will she have remaining after 5 weeks?
- How much will she have remaining after 9 weeks?
- What quantity is changing each time? What variable will you use to represent this quantity?
- Write an expression to represent the scenario.

**Review: Simplify each expression**

a.  $-5(x + 4) + 2(-2x - 3)$

b.  $2(-x - 4) - 6(x - 2) + 8x$

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**Day 2- Translating Algebraic Expressions Practice & Day 1 Review**


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**1. Write each phrase as an algebraic expression:**

a. Fourteen decreased by a number  $p$ .  
 b. Five more than twice a number.

c. 14 less than  $m$ .  
 d. 18 more than  $y$ .

e. The quotient of a number and 9  
 f. The product of 5 and  $y$  added to 3

g. 4 times a number cubed decreased by 7  
 h. 3 more than four times a number

**2. Simplify:**

a.  $7(2 - 3x) - 5(6 + x) + 4x$

b.  $-4(-2x + 5) + 2(\frac{1}{2}x + 2)$

c.  $-6(-4x + 8) + 10 + 3(-5x + 7)$

d.  $8 - 4(-x - 11) - 5(x + 9) + 13x$

**3. Evaluate:**

a.  $\frac{-7d+14}{2}$  when  $d = -4$

b.  $32.68 - 4.15q$  when  $q = 10$

**4. Answer the following using the scenario:**

*You really want to purchase the skateboard shown at the left. Your aunt gives you \$45 to start and you save \$3 each week. The expression  $45 + 3w$  gives the amount of money you save after  $w$  weeks. Answer the following:*



a. How much will you have after 4 weeks? 10 weeks? 20 weeks?

b. What does the 45 represent in the expression? What does the  $3w$  represent?

c. Challenge: After how many weeks will you have enough money? Show how you arrived at your answer.

### Day 3 - Creating Algebraic Expressions - Complex

For each word problem, show the work to how you arrived at your answer for parts A and B. Define the quantity that is changing each time in part C. Using your work, create an algebraic expression for part D.

1. Conner gets \$20 per week allowance. He also makes \$10 per lawn he mows. He saves half of his money each week. Let's look at what he gets for ONE week.

- If he mows 3 lawns, how much will he have to spend?
- If he mows 8 lawns, how much will he have to spend?
- What quantity is changing each time? What variable will represent this quantity?
- Write an expression to represent the scenario.

2. Katherine is trying to read as many books as possible this semester. Her father will give her a quarter for every book she reads. She has already read 17 books.

- If she reads 30 more books, how much money will her father owe her?
- If she reads 42 more books, how much money will her father owe her?
- What quantity is changing each time? What variable will represent this quantity?
- Write an expression to represent the scenario.

3. Four students are assigned a project. They must each write an even portion of their summary paper. They each already wrote one page of introduction.

- If the paper is supposed to be 32 pages long, how many more pages does each student need to write?
- If the paper is supposed to be 64 pages long, how many more pages does each student need to write?
- What quantity is changing each time? What variable will represent this quantity?
- Write an expression to represent the scenario.

**Directions:** Complete each table.

4. Leroy has three times as many books as Nathan.

| Write an expression for each person: | Write an expression for the total: | Answer the following:                                   |
|--------------------------------------|------------------------------------|---|
| Nathan: _____                        |                                    | a. If Nathan has 7 books, how many does Leroy have?     |
| Leroy: _____                         |                                    | b. If Nathan has 12 books, how many do they have total? |
|                                      |                                    |   |

5. Caroline has 5 more pairs of shoes than Samantha. Rebekah has twice as many pairs of shoes as Caroline.

| Write an expression for each person: | Write an expression for the total: | Answer the following:  |
|--------------------------------------|------------------------------------|--|
| Samantha: _____                      |                                    | a. If Samantha has 5 pairs of shoes, how many does Rebekah have?   |
| Caroline: _____                      |                                    | b. If Samantha has 12 pairs of shoes, how many do they have total? |
| Rebekah: _____                       |                                    |  |

6. Grayson has one fewer sibling than Noah. Nick has three more siblings than Grayson.

| Write an expression for each person: | Write an expression for the total: | Answer the following:  |
|--------------------------------------|------------------------------------|--|
| Noah: _____                          |                                    | a. If Noah has 2 siblings, how many does Grayson and Nick each have? |
| Grayson: _____                       |                                    | b. If Noah has 5 siblings, how many siblings do they have total?     |
| Nick: _____                          |                                    |  |

7. Three sisters spent different amounts of money on their recent vacation. Bailey spent \$25 less than Jazlynn. Yadira spent three times as much as Bailey.

| Write an expression for each person: | Write an expression for the total: | Answer the following:  |
|--------------------------------------|------------------------------------|--|
| Jazlynn: _____                       |                                    | a. Jazlynn spent \$125, how much did Bailey and Yadira spend?    |
| Bailey: _____                        |                                    | b. If Jazlynn spent \$500, how much did they spend all together? |
| Yadira: _____                        |                                    |  |

## Day 4 - Review of Exponents

1. Directions: Simplify each expression.

a.  $x^2 \cdot x^3$

b.  $y^3 \cdot y^5$

c.  $n^4 \cdot n^5$

d.  $x^2 y^3 x^3 y^5$

e.  $a^2 b^3 \cdot ab^4$

f.  $7y^3 z^4 \cdot 2yz^3$

g.  $3mn^3 \cdot 8m^4 n^7$

h.  $9b^2 \cdot 2a^4 \cdot a^2 b^6$

2. Direction: Simplify each expression.

a.  $(x^5)^2$

b.  $(n^4)^3$

c.  $-(m^2)^4$

d.  $(3x^2 y)^4$

e.  $(-5y^3 z^2)^3$

f.  $(-4mn^2)^2$

g.  $(2ab^3)^4$

h.  $(-2x^3 y^4)^2$

3. Directions: Simplify each expression:

a.  $\frac{x^4}{x^3}$

b.  $\frac{y^4}{y^2}$

c.  $\frac{a^3}{a^2}$

d.  $\frac{-h^{14}}{h^8}$

e.  $\frac{-12x^7}{3x^2}$

f.  $\frac{45a^2 b^3}{-5a^4 b}$

g.  $\frac{24y^8}{4y^4}$

h.  $\frac{10m^8 n^3}{2m^7}$

## Day 5 - Multiplying &amp; Simplifying Radical Expressions

## RADICALS ARE IN SIMPLEST FORM WHEN...

★ NO perfect square factors other than 1 are under the radical.

Simplify:

1.  $\sqrt{108}$

2.  $\sqrt{20}$

3.  $-4\sqrt{40}$

4.  $\sqrt{x^8}$

5.  $\sqrt{t^4 q^8}$

6.  $\sqrt{a^6 bc^2}$

7.  $\sqrt{24x^2 y^8}$

8.  $\sqrt{18x^7 y^4}$

9.  $\sqrt{100j^8 k^{13}}$

10.  $5\sqrt{8x^4 y^7 z^8}$

11.  $3x\sqrt{16x^{10} y^4}$

12.  $-2\sqrt{15x^2 y^8}$

1.  $\sqrt{3} \cdot 2\sqrt{6}$

2.  $4\sqrt{5} \cdot 2\sqrt{5}$

3.  $-3\sqrt{2} \cdot 7\sqrt{36}$

4.  $3\sqrt{x} \cdot 2\sqrt{x^2}$

5.  $\sqrt{18a^2} \cdot 4\sqrt{3a^2}$

6.  $\sqrt{50x} \cdot 4\sqrt{4x}$

7.  $-3\sqrt{7x^3} \cdot 6\sqrt{7x^2}$

8.  $\sqrt{xy} \cdot \sqrt{x^2y^3}$

9.  $x\sqrt{x^2yz} \cdot xy\sqrt{yz^3}$

**Day 6 - Adding and Subtracting Radicals**

Simplify:

1.  $6\sqrt{6} - 2\sqrt{6}$

2.  $-3\sqrt{7} + 4\sqrt{7}$

3.  $-10\sqrt{5} + 12\sqrt{5}$

4.  $2\sqrt{6} - 2\sqrt{24}$

5.  $2\sqrt{6} + 3\sqrt{54}$

6.  $3\sqrt{8} + 3\sqrt{2}$

7.  $3\sqrt{18} - 2\sqrt{2}$

8.  $-3\sqrt{20} - \sqrt{80} + 8\sqrt{3}$

9.  $5\sqrt{2}(3\sqrt{10} - 2\sqrt{5})$

10.  $\sqrt{32x^3y} + \sqrt{50x^3y}$

11.  $\sqrt{8x^4y^4} + \sqrt{12x^4y^4}$

12.  $\sqrt{x}(x\sqrt{x^2y} - \sqrt{xy^2})$