

Accelerated 6 • Unit 4 Worksheet

Equations and Expressions

Name: _____

Date: _____

Part A • Quick Computations

Evaluate or simplify mentally.

$3 \cdot (5+2)$ _____	$2^3 + 1$ _____	$5x$ when $x=4$ _____	$(x+y)$ when $x=3$, $y=7$ _____
--------------------------	--------------------	--------------------------	--

Part B • Expressions: Equal or Equivalent?

1. For each pair, decide: are the expressions EQUAL for one value of x only, EQUIVALENT for all values, or NEVER equal? Justify each.

a. $3x + 6$ and $3(x + 2)$

b. $x + 5$ and $2x + 5$

c. $x + 5$ and $5 + x$

d. $2x + 4$ and $2x + 5$

2. Mai claims that x^2 and $2x$ are 'basically the same.' Test her claim by evaluating each at $x = 0, 1, 2, 3$.

Build a small table or list:

Is Mai right? ☐ Yes ☐ No Why?

Part C • Solving Equations in One Variable

3. Solve each equation. Show your work AS a sequence of equivalent equations (one move per line).

a. $x + 12 = 30$ $x = \underline{\hspace{2cm}}$

b. $5x = 45$ $x = \underline{\hspace{2cm}}$

c. $x/4 = 12$ $x = \underline{\hspace{2cm}}$

d. $3x + 7 = 25$ $x = \underline{\hspace{2cm}}$

4. Write an equation for each situation. Then solve.

a. Lin spent \$32 on 4 books, each the same price. What did each book cost?

Equation: $\underline{\hspace{2cm}}$ Answer: \$ $\underline{\hspace{2cm}}$

b. A number tripled, plus 7, equals 28. What is the number?

Equation: _____ Answer: _____

c. A rectangle has perimeter 50 cm and width 9 cm. What is the length?

Equation: _____ Answer: _____ cm

Part D • Exponents

5. Write each expression as a single power, or evaluate it.

a. $2^2 \cdot 2^3 =$ _____

b. $5^3 =$ _____

c. $(3 + 4)^2 =$ _____

d. $3^2 + 4^2 =$ _____

6. Diego says: " $(3 + 4)^2 = 3^2 + 4^2$ ". Test his claim with the numbers above. What does this tell you about applying exponents to a sum?

Part E • Relationships Between Quantities

7. A taxi charges \$3 for the pickup plus \$2 per mile.

a. Write an equation relating the fare F to the miles m .

b. How much for 10 miles? _____

c. If Sara paid \$19, how far did she go? _____ miles

d. Sketch a graph of F vs. m for 0 to 5 miles, marking key points.

Part F • Thinking Deeply

8. Han wrote: "Solving $3x + 7 = 25$ means: do the opposite of each step. So subtract 7, then divide by 3." Lin asks: "Why is THAT the right order? Why not divide by 3 first?"

Solve both ways and check that you get the same answer:

Why is doing it Han's way usually easier?

9. A number x satisfies $x^2 = 9$. Sara says: $x = 3$. Diego says: x could ALSO be -3 .

Who is right? ☐ Sara ☐ Diego ☐ Both

Explain:

10. Write a real-world situation that the equation $4x + 10 = 50$ could represent. Make sure all numbers have meaning.
