

Grade 7 • Unit 6 Worksheet

Expressions, Equations, and Inequalities

Name: _____

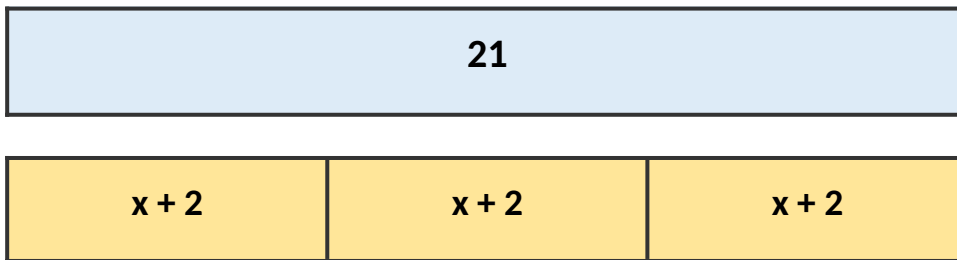
Date: _____

Part A • Warm-up: Tape Diagrams to Equations

1. A tape diagram shows: 3 equal parts each labeled $(x + 2)$, and the total is 21.

- Write an equation that matches this diagram: _____
- Solve for x :

c. $x =$ _____



Part B • Two Equation Forms (the Big Idea)

2. For each situation, write an equation. Then solve.

- Lin spent \$40 total. She bought a shirt for \$16 and three identical pairs of socks. What did each pair of socks cost?

Equation form $3x + 16 = 40$. $x = \$$ _____

- Diego saved up some money. He spent \$5 of it on candy, then split the rest equally among 4 friends. Each friend got \$7. How much did Diego save?
-

Equation form $(m - 5)/4 = 7$ OR $m = ?$. $m = \$$ _____

Part C • Hanger Diagrams → Solving Equations

3. Solve each equation. Show every step (use 'do the same to both sides' reasoning).

a. $5x - 12 = 18$

b. $2(x + 7) = 26$

c. $-4x + 9 = 21$

d. $(1/3)(x - 6) = 5$

Part D • Inequalities

4. Solve and graph each inequality.

a. $3x + 4 \leq 19$. $x \leq$ _____

Graph on a number line (use closed or open circle correctly):

b. $-2x > 10$. x _____

Hint: when you divide by a negative, the inequality FLIPS. Did you flip it?

5. Han is saving to buy a \$90 game. He has \$24 saved already and earns \$11 per hour at his job.

Write an inequality that represents the number of hours h he must work to have enough money.

Solve for h :

Minimum whole hours: _____ hours

Part E • Equivalent Expressions

6. Simplify by combining like terms or distributing. Show each step.

a. $3(x + 4) - 2x =$ _____

b. $-2(3x - 5) + 4x =$ _____

c. $5x - (x - 8) =$ _____

d. $0.5(6y - 2) + 3 =$ _____

Part F • Error Analysis & Reasoning

7. Tyler solved $5(x - 3) = 25$ like this: $5x - 3 = 25$, $5x = 28$, $x = 5.6$. Is Tyler correct?

Is the answer right? ☐ Yes ☐ No

What was Tyler's error?

Correct solution: $x =$ _____

8. Two methods. Solve $3(2x + 5) = 27$ in TWO different ways.

Method 1. Distribute first, then solve.

Method 2. Divide both sides by 3 first, then solve.

Do you get the same answer both ways? ☐ Yes ☐ No. $x =$ _____

9. Mai says these expressions are equivalent: $3x + 6$ and $3(x + 6)$. Is she correct?

Test by plugging in $x = 2$. What does each give you?

Are they equivalent? ☐ Yes ☐ No. What expression IS equivalent to $3(x + 6)$?

10. Write a story problem that could be modeled by the equation $2x + 8 = 30$, and explain what x represents.
