Year 8 · Algebra: Solving Equations and Spotting Patterns

Name: _____ Date: _____

Kia ora! This sheet helps you get confident forming and solving equations, simplifying expressions, and finding the rules behind number patterns. Take your time and check each answer by substituting back in.

Warm-up

1. Solve: $x + 8 = 15$

2. Simplify: $4a + 3a - a$

3. If $w = 5$, find the value of $w + 12$.

4. Solve: $3s = 18$

Practice

5. Solve: $5s + 9 = -6$

6. Solve: $t + 7 = 6.5$

7. Expand and simplify: $2(x + 3) + 1$

8. Factorise fully: $5x - 35$

9. Aroha buys 4 identical smoothies at the Avondale market and pays with a $20 note. She gets $3.20 change. Write and solve an equation to find the price of one smoothie.

10. To hire a kayak on the Whau River costs a $12 booking fee plus $9 for each hour. The cost C in dollars for h hours is $C = 9h + 12$. (a) Find the cost for 4 hours. (b) Tane paid $75. Solve for how many hours he hired the kayak.

Challenge

11. Solve the inequality $t - 3 \geq -5$ and show the solution on a number line.

12. A tiling pattern grows so that shape 1 uses 5 tiles, shape 2 uses 8 tiles, shape 3 uses 11 tiles. (a) Write a rule for the number of tiles t in terms of the shape number n. (b) How many tiles are in shape 10? (c) Which shape uses 62 tiles?