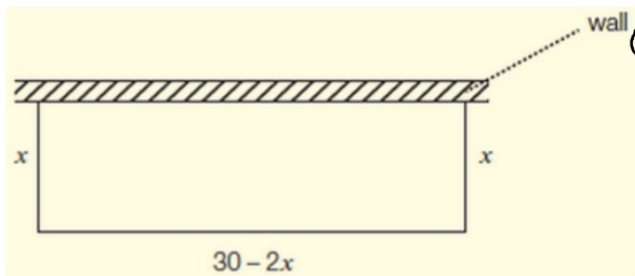


Name: \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

## Lesson 2.3 (Part 2) - Quadratic Equations APPLICATIONS

1. A farmer has 30 m of fencing to make a safe rectangular enclosure (a 'pen') for his lambs. He can use a wall to make one side, and the fencing to make the other three sides. He would like the area of the enclosure to be  $108 \text{ m}^2$ . Find the length and width of this pen.



2. The product of two consecutive **positive** integers is 306. If the smaller number is  $n$ , write an equation in the form  $ax^2 + bx + c = 0$  to represent the product of the numbers. Hence solve the equation to find the two numbers.

$$\begin{aligned} 1^{\text{st}} &= n \\ 2^{\text{nd}} &= n+1 \end{aligned}$$

$$n(n+1) = 306$$

$$n^2 + n = 306$$

$$n^2 + n - 306 = 0$$

$$n = 17$$

$$\boxed{17 + 18}$$

$$A = lw$$

$$108 = (30 - 2x)(x)$$

$$108 = 30x - 2x^2$$

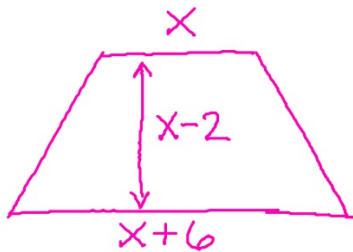
$$2x^2 - 30x + 108 = 0$$

$$x = 6 \Rightarrow w = 6 + l = 18$$

$$x = 9 \Rightarrow w = 9 + l = 12$$

- ③ The lengths of the parallel sides of a trapezium are  $x$  cm and  $(x + 6)$  cm. The distance between the parallel sides is  $(x - 2)$  cm, and the area of the trapezium is  $150 \text{ cm}^2$ .

- a. Form a quadratic equation in terms of  $x$  for the area of the trapezium.



$$A = \frac{1}{2}(b_1 + b_2)h$$
$$150 = \frac{1}{2}(2x+6)(x-2)$$
$$150 = (x+3)(x-2)$$
$$150 = x^2 - 2x + 3x - 6$$
$$0 = x^2 + x - 156$$

- b. Solve the equation to find  $x$ .

$$x = 12$$

- c. Hence find the dimensions of the trapezium.

$$b_1 = x = \boxed{12}$$

$$b_2 = x + 6 = \boxed{18}$$

$$h = x - 2 = \boxed{10}$$

# **Classwork**

Exercise 2.8 - #s: 2 & 4