Problems Leading to Quadratics

Starter

1. **(Review of last lesson)** Solve $x - 2 = \dfrac{4}{x+1}$.

2. I think of a number, square it and then subtract the original number. The result is 30. What was the original number I thought of?

Notes

Read the question several times to get an idea what it wants. Break down what is written into small chunks. Write down what you know before attempting to form a quadratic equation.

Once you have found your answers, decide whether both values are valid. For example, can a shape have a side that is -6 cm long?

E.g. 1 The dimensions of a rectangle are x m and $(x+3)$ m. Given that the area is 28 m^2, find x.

Working:

Length $\times$ width $=$ Area of a rectangle

$x(x+3) = 28$

$x^2 + 3x - 28 = 0$ ***expand the brackets and make*** $= 0$

M: $-28 = -4 \times 7$

A: $3 = -4 + 7$

$x^2 - 4x + 7x - 28 = 0$ ***split*** $3x$ ***into*** $-4x + 7x$

$x(x-4) + 7(x-4) = 0$ ***factorise by grouping (same brackets)***

$(x-4)(x+7) = 0$

$\therefore x - 4 = 0$ or $x + 7 = 0$

$x = 4$ or $x = -7$

Since $x > 0$, $x = 4$

E.g. 2 The base of a triangle is x and its perpendicular height is $x - 5$. If the area is 12 cm^2, find x.

E.g. 3 A right-angle triangle has sides x, $x+2$ and $x+4$. Find x.

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	p117 E4.5 Qu 1-3, 5-15
A*-G class textbook:	p107 E4.5 Qu 1-3, 5-15
9-1 homework book:	p42 E4.5 Qu 1-9
A*-G homework book:	p30 E4.5 Qu 1-7

Homework book answers (only available during a lockdown)