

IB Math Studies 1 BELL WORK

Wayne has a collection of 2 cent and 5 cent stamps. He has three times as many 2 cent stamps as 5 cent stamps, and the total value of the stamps is 66 cents. How many 5 cent stamps does Wayne have?

IB Math Studies 1 BELL WORK

Solve each equation by factoring.

$$x^2 - 11x + 19 = -5$$

$$x^2 - 11x + 24$$

$$(x-8)(x-3)$$

$$x-8=0 \quad x-3=0$$

$$x=8 \quad x=3$$

$$6b^2 - 13b + 3 = -3$$

$$6b^2 - 9b - 4b + 6 = 0$$

$$3b(2b-3) - 2(2b-3)$$

$$(3b-2)(2b-3)$$

$$b = 2/3 \quad b = 3/2$$

$$6b^2 - 13b + 6 = 0$$

$$-4k^2 - 8k - 3 = -3 - 5k^2$$

$$k^2 - 8k = 0$$

$$k(k-8) \quad k=0 \quad k=8$$

Complete:

Exercises

4F # 7, 8

4G # 1, 4

4H.1 # 2a-b

4H.2 # 2 a-c

4I # 1, 2, 3, 4, 6

4I #2) $X = \text{small} \#$

#9)

$$\begin{cases} 13S + 14L = 9 \\ 4S + 12L = 6 \end{cases}$$
$$S = \frac{6}{25}L = 0.24L$$
$$L = \frac{21}{50}L = 0.42$$

$2X + 1 = \text{big} \#$

$X + 2X + 1 = 82$

$X = 27$

Chapter

4

Equations and formulae

Syllabus reference: 1.6

- Contents:**
- A** Algebraic substitution
 - B** Linear equations
 - C** Equations involving fractions
 - D** Solving equations using technology
 - E** Problem solving with linear equations
 - F** Formula substitution
 - G** Formula rearrangement
 - H** Linear simultaneous equations
 - I** Problem solving with simultaneous equations
 - J** Quadratic equations
 - K** Problem solving with quadratics



J

QUADRATIC EQUATIONS

A **quadratic equation** in x is an equation which can be written in the form $ax^2 + bx + c = 0$ where a , b , and c are constants and $a \neq 0$.

The solutions of the equation are the values of x which make the equation true. We call these the **roots** of the equation, and they are also the **zeros** of the quadratic expression $ax^2 + bx + c$.

Solve for x :

a $3x^2 - 1 = 8$

$$+1 +1$$

$$\frac{3x^2}{3} = \frac{9}{3}$$

$$x^2 = 3$$

$$x = \pm 1.73$$

$$x = \pm \sqrt{3}$$

b $5 - 2x^2 = 11$

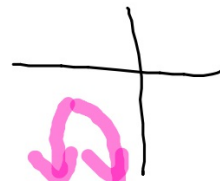
$$-5 \quad -5$$

$$\frac{-2x^2}{-2} = \frac{6}{-2}$$

$$x^2 = -3$$

$$x = \pm \sqrt{-3}$$

$$x = \pm i\sqrt{3}$$



Solve for x :

a $\sqrt{(x+3)^2} = \sqrt{36}$

$$\begin{array}{r} x+3 = \pm 6 \\ -3 \quad -3 \\ 6-3 \quad -6-3 \\ x=3 \quad x=9 \end{array}$$

b $\sqrt{(x-4)^2} = \sqrt{7}$

$$\begin{array}{r} x-4 = \pm\sqrt{7} \\ +4 \quad +4 \\ x = 4 \pm\sqrt{7} \end{array}$$

THE NULL FACTOR LAW

The **Null Factor law** states:

When the product of two (or more) numbers is zero then at least one of them must be zero.
So, if $ab = 0$ then $a = 0$ or $b = 0$.

Solve for x using the Null Factor law:

a $3x(x - 5) = 0$

$$3x = 0 \quad x - 5 = 0$$

$$x = 0 \quad x = 5$$

b $(x - 4)(3x + 7) = 0$

$$x - 4 = 0$$

$$x = 4$$

$$3x + 7 = 0$$

$$x = -\frac{7}{3}$$

SOLUTION USING TECHNOLOGY

Use technology to solve:

a $x^2 - 5x + 6 = 0$

b $x^2 + 9x + 14 = 0$

c $10x^2 + 63 = 53x$
 $-53x \quad -53x$

$$10x^2 - 53x + 63 = 0$$

Assignment:

Exercises

4 K # 3, 6, 9, 12, 14