Maths
Quadratic Equations

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Term 1/2

Contents

0.1 Factoring Quadratics

0.1.1 Difference of squares

Theorem 0.1.1 Completing the Square

This factorisation involves taking the square root of the numbers involved and factorising.
See Q1 and Q2

Question 1

$$-\mathcal{X}^2 - 9$$

$$(\mathcal{X} + 3)(\mathcal{X} - 3)$$
$$\mathcal{X} = \pm 3$$

Question 2

$$64\mathcal{X}^2 - 25\mathcal{Y}^2$$

$$(8\mathcal{X} - 5\mathcal{Y})(8\mathcal{X} + 5\mathcal{Y})$$

Note:-

Cannot gain intercepts from this(to many variables)

0.1.2 Common factorising

Theorem 0.1.2 Common factorising

When we common factor, we take the GCF out of both numbers by dividing
and then factror the samaller numbers. SEE examples below.

Question 3

$$3\mathcal{X}^2 - 75\mathcal{Y}^2$$

$$= 3(\mathcal{X}^2 + 25\mathcal{Y}^2)$$
$$= 3(\mathcal{X} - 5\mathcal{Y})(\mathcal{X} + 5\mathcal{Y})$$

Note:-

Remember to factor out coefficient first

Question 4

$$6\mathcal{X}^2 + 12\mathcal{X}$$

$$= 6\mathcal{X}(\mathcal{X} + 2)$$

0.1.3 Factoring by Grouping Pairs(IN Progress)

Theorem 0.1.3 Grouping pairs

Grouping pairs involves four term expressions and factorising them by grouping into like terms and then obtaining the GCF. SEE Q5 and Q6 for examples

Question 5

$$X^2 + 4X + \alpha X + 4\alpha$$

$$= (4X + 4\alpha)(X^2 + \alpha X)$$
$$= 4(X + \alpha)X(X + \alpha)$$
$$= (X + \alpha)(4 + X)$$

Note:-

Remember that if the same expression is inside the brackets
you can factorise the coefficient of the brackets into one of the sets

Question 6

$$X^2 + 7X + \beta X + 7\beta$$

$$= (7X + 7\beta)(X^2 + \beta X)$$
$$= 7(X + \beta)X(X + \beta)$$
$$= (X + \beta)(7 + X)$$

0.1.4 Trinomials

Trinomial A