EXAM PAPERS PRACTICE

GCSE Edexcel Math
1MA1
Factorizing Quadratics

Answers

"We will help you to achieve A Star "

Answer 1

Factorise $x^2 + 3x - 10$

$x^2 + 3x - 10$

$= (x + 5)(x - 2)$

SIGNS IN BRACKETS ARE DIFFERENT

LARGER NUMBER IS POSITIVE

-10

-1×10

-2×5

SEE TUTORIAL ON FACTORISING QUADRATICS FOR MORE HELP!

Answer 2

(a) (i) Factorise $x^2 - 12x + 27$

$= (x - 3)(x - 9)$

(ii) Solve the equation $x^2 - 12x + 27 = 0$

$(x - 3)(x - 9) = 0$

EITHER $x - 3 = 0$ OR $x - 9 = 0$

$x = 3$ OR $x = 9$

Answer 3

Factorise $y^2 - 2y$

Common factor is y

$y(y-2)$

Answer 4

Factorise $y^2 + 7y + 6$

BOTH SIGNS WILL BE SAME
BOTH BE POSITIVE

$= (y + 1)(y + 6)$

$+6$

1×6

2×3

IS GREATER THAN

Answer 5

Factorise $y^2 - 10y + 16$

+VE SO SIGNS WILL BE THE SAME

-VE SO BOTH -VE

$+16$

-1×-16

-2×-8

$= (y - 2)(y - 8)$

Answer 6

Factorise $x^2 - 49$

$= x^2 - 7^2$

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

D.O.T.S.

$(a+b)(a-b) = a^2 - b^2$

Answer 7

Factorise $2p^2 - p - 10$

-20

-20×1

-10×2

-5×4

$= 2p^2 - 5p + 4p - 10$

$= p(2p - 5) + 2(2p - 5)$

$= (2p - 5)(p + 2)$

Answer 8

Factorise fully $8a^2 + 12a$

$= 4 \times 2 \times a \times a + 4 \times 3 \times a$

$= 4a(2a + 3)$

Answer 9

Factorise $e^2 + e - 12$

SIGNS DIFFERENT

BIGGER NUMBER +VE

$= (e - 3)(e + 4)$

-12

-1×12

-2×6

-3×4

Answer 10

(b) Hence, or otherwise, simplify fully $(x^2 + 4)^2 - (x^2 - 2)^2$

LET $a = (x^2+4)$ AND $b = (x^2-2)$

THEN $(a - b)(a + b)$

$(x^2+4)^2 - (x^2-2)^2 = (x^2+4 - (x^2-2))(x^2+4+x^2-2)$

$= (\quad 6 \quad)(2x^2 + 2)$

$= 6(2x^2+2)$

$= 12x^2 + 12$

Answer 11

Solve $x^2 = 4(x-3)^2$

$x^2 = 4(x^2 - 6x + 9)$

$x^2 = 4x^2 - 24x + 36$

$-x^2 \quad -x^2$

$\frac{0}{3} = \frac{3x^2}{3} - \frac{24x}{3} + \frac{36}{3}$

$0 = x^2 - 8x + 12$ → SIGNS SAME BOTH -VE

$0 = (x-2)(x-6)$

$(2x-3)^2$

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

F O I L

$= x^2 - 3x - 3x + 9$

$= x^2 - 6x + 9$

$+12$

-1×-12

-2×-6

$x - 2 = 0$ or $x - 6 = 0$

$+2 \quad +2 \qquad +6 \quad +6$

$x = 2$ $\qquad$ $x = 6$

Answer 12

Factorise completely $(12x - y)^2 - (4x - 3y)^2$

$(12x - y)(12x - y) - (4x - 3y)(4x - 3y)$

Expand using foil

$(144x^2 - 12xy - 12xy + y^2) - (16x^2 - 12xy - 12xy + 9y^2)$

$144x^2 - 12xy - 12xy + y^2 - 16x^2 + 12xy + 12xy - 9y^2$

$144x^2 - 16x^2 + y^2 - 9y^2$

$128x^2 - 8y^2$

$8(16x^2 - y^2)$

Difference of two squares $\longrightarrow$ $8(4x - y)(4x + y)$

$8(4x - y)(4x + y)$

Answer 13

(a) Show that

$$(a^2 + 1)(c^2 + 1) = (ac - 1)^2 + (a + c)^2$$

LHS : $(a^2c^2 + c^2 + a^2 + 1)$

RHS : $(ac-1)(ac-1) + (a+c)(a+c)$

$= a^2c^2 - 2ac + 1 + a^2 + 2ac + c^2$

$=(a^2c^2 + c^2 + a^2 + 1)$

Therefore LHS = RHS

Answer 14

Simplify fully $(2x + 3)^2 - (2x - 3)^2$

Difference of two squares

$a^2 - b^2 = (a - b)(a + b)$

((2x +3) + (2x -3)) ((2x +3) - (2x -3))

Simplify each term

(4x) (6) = 24x

Answer 15

Factorise fully $20x^2 - 5$

$20x^2 - 5$

$= 4 \times 5 \times x \times x - 5 \times 1$

$= 5(4x^2 - 1)$

$(2x)^2 - 1^2$

$a^2 - b^2$

$= 5(2x - 1)(2x + 1)$

DIFFERENCE OF TWO SQUARES

$a^2 - b^2 = (a-b)(a+b)$