

Unit 5-3: Solving Quadratics by factoring

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$0 = x^2 - 8x + 12$
 $0 = (x-2)(x-6)$
 $x-2=0 \quad x-6=0$
 $x+2=2 \quad x+6=6$
 $x=2 \quad x=6$

F	O	I	L
1	u	n	4
2	y	n	3
3	q	n	4

Ex #1: $-\frac{1}{3}$ and 6 as roots

$(x-p)(x-q) = 0$
 $(x + \frac{1}{3})(x-6) = 0$
 $x^2 - 6x + \frac{1}{3}x - 2 = 0$

Ex #2 FACTOR

a) $16x^2 + 8x$
 $2 \cdot 8x \cdot x \quad 8 \cdot x = 1$
 $8x(2x+1)$

2A) $20x^2y - 15xy^2$
 $5 \cdot 4x^2y \quad 3 \cdot 5xy^2$
 $5xy(4x-3y)$

b) $x^2 - \frac{1}{3}x - 2 = 0$
 $3x^2 - 17x - 6 = 0$

b) $7x^2 + 6xy^2 + 14xy + 12y^2$
 $(7x^2 + 14xy) + (6xy^2 + 12y^2)$
 $7x(x+2y) + 6y^2(x+2y)$
 $(7x+6y^2)(x+2y)$

$a^2 - b^2 = (a+b)(a-b)$
 $a^2 \pm 2ab + b^2 = (a \pm b)^2$

Ex #3a) $x^2 + 16x + 64$
 $x \cdot x \quad 8 \cdot 8 \quad 4 \cdot 2 \cdot 2$
 $(x+8)(x+8)$
 $(x+8)^2$

c) $ab + 3cd + 4a^2b + 12acd$
 $(ab + 4a^2b) + (3cd + 12acd)$
 $ab(1+4a) + 3cd(1+4a)$
 $(ab+3cd)(1+4a)$

b) $36a^2 - 64y^2$
 $4(9a^2 - 16y^2)$
 $3a \cdot 3a \quad 4y^2 \cdot 4y^2$
 $(3a)^2 - (4y)^2$

$a^2 - b^2 = (a+b)(a-b)$
 3b) $81x^2 - 4y^2$
 $(9x)^2 - (2y)^2$
 $(9x+2y)(9x-2y)$

Ex #4) $x^2 + 9x + 20$
 $x \cdot x \quad 5 \cdot 4 \quad 5 \cdot 2 = 10$
 $(x+5)(x+4)$

$(9x+2y)(9x-2y)$
 $3y(5x+3)(5x-3)$

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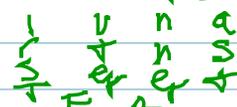
$$0 = x^2 - 8x + 12$$

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

$$\begin{array}{l} x-2=0 \quad x-6=0 \\ +2 \quad +2 \quad +6 \quad +6 \end{array}$$

$$\boxed{x=2} \quad \boxed{x=6}$$

F O I L



$$(x-2)(x-6)$$

$$x^2 - 6x - 2x + 12$$

Ex #1: $p = -\frac{1}{3}$ and $q = 6$ as roots

$$(x-p)(x-q) = 0$$

$$(x + \frac{1}{3})(x-6) = 0$$

$$x^2 - 6x + \frac{1}{3}x - 2 = 0$$

$$3x^2 - 5\frac{2}{3}x - 2 = 0$$

$$\boxed{3x^2 - 17x - 6 = 0}$$

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

$$a^2 \pm 2ab + b^2 = (a \pm b)^2$$

EX #2 FACTOR

a) $16x^2 + 8x$

$$2 \cdot 8x \cdot x \quad 8 \cdot x \cdot 1$$

$$\boxed{8x(2x+1)}$$

2A) $20x^2y - 15xy^2$

$$5 \cdot 4x^2y \quad 3 \cdot 5xy^2$$

$$\boxed{5xy(4x-3y)}$$

b) $7x^2 + 6xy^2 + 14xy + 12y^3$

$$(7x^2 + 14xy) + (6xy^2 + 12y^3)$$

$$7x(x+2y) + 6y^2(x+2y)$$

$$\boxed{(7x+6y^2)(x+2y)}$$

Ex #3 a) $x^2 + 16x + 64$

$1^2=1$
 $2^2=4$
 $3^2=9$
 $4^2=16$

$x \cdot x$ $8 \cdot 8$

$$(x+8)(x+8)$$

$$\boxed{(x+8)^2}$$

$$\boxed{(7x+6y^2)(x+2y)}$$

b) $36a^2 - 64y^2$

$$4(9a^2 - 16y^2)$$

$$3a \cdot 3a \quad 4y^2 \cdot 4y^2$$

$$(3a)^2 - (4y)^2$$

$$\boxed{4(3a+4y^2)(3a-4y^2)}$$

2C) $ab + 3cd + 4a^2b + 12acd$

$$(ab + 4a^2b) + (3cd + 12acd)$$

$$a(b + 4a) + 3cd(1 + 4a)$$

$$\boxed{(ab+3cd)(1+4a)}$$

Ex #4) $x^2 + 9x + 20$

$2^2=4$
 $3^2=9$
 $4^2=16$
 $5^2=25$
 $6^2=36$

$x \cdot x$ $5 \cdot 4$

$$(x+5)(x+4)$$

3C) $75x^2y - 27y^3$

$$3y(25x^2 - 9y^2)$$

$$(9x)^2 - (3y)^2$$

$$\boxed{3y(5x+3)(5x-3)}$$

Ex #4) $x^2 + 9x + 20$

$2^2=4$
 $3^2=9$
 $4^2=16$
 $5^2=25$
 $6^2=36$

$x \cdot x$ $5 \cdot 4$

$$(x+5)(x+4)$$