

# QUIZ

Fully factor

a)  $8x^2 + 10x - 3$

$$= (2x+3)(4x-1)$$
  

$$\begin{matrix} M & -24 \\ A & 10 \\ N & 12, -2 \\ \frac{8x}{12} & \frac{8x}{2} \\ \frac{2x}{3} & \frac{4x}{-1} \end{matrix}$$

b)  $x^2 - xy - 42y^2$

$$= x^2 - 7xy + 6xy - 42y^2$$
  

$$= x(x-7y) + 6y(x-7y)$$
  

$$= (x-7y)(x+6y)$$
  

$$\begin{matrix} M & -42 \\ A & -1 \\ N & (-7, +6) \end{matrix}$$

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4.7 Factoring Perfect Square and Difference of Square Trinomials

**A) Difference of Squares**

Expand:

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

$$= x^2 - 9$$

$$(3m-1)(3m+1)$$
  

$$= 9m^2 - 1$$

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

$$= a^2 - b^2$$

1. How are the binomials above alike?

\* Same numbers, different sign

2. Write a rule for factoring a DIFFERENCE OF SQUARES.

↳ looking for 2 perfect squares separated by a negative

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

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Ex. 1 Factor the following completely

a)  $m^2 - 16$

$$= (m-4)(m+4)$$

b)  $4a^2 - 49$

$$= (2a+7)(2a-7)$$

c)  $64x^2 - 9y^2$

$$= (8x-3y)(8x+3y)$$

d)  $8x^2 - 50$

$$= 2(4x^2 - 25)$$

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

e)  $x^4 - 16$

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

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

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

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**B) Perfect Square Trinomials**

Expand:

$$(x+3)^2 = (x+3)(x+3) \quad (3m-1)^2 \quad (a+b)^2 \quad (a-b)^2$$

$$= x^2 + 3x + 3x + 9 = 9m^2 - 6m + 1 = a^2 + 2ab + b^2 = a^2 - 2ab + b^2$$

$$= x^2 + 6x + 9$$

Each result is a **perfect square trinomial**.

Which of the following are perfect square trinomials?

- a)  $x^2 - 6x + 9$  ✓
- b)  $6x^2 - 12x + 9$  ✗
- c)  $4x^2 + 8x + 16$  ✗
- d)  $25x^2 - 90x + 81$  ✓
- e)  $4x^2 - 4x - 1$  ✗

Perfect Square

The first and last terms are perfect squares and the middle term is twice the product of the roots of the first and last term.

Write a rule for factoring perfect square trinomials.

RULE:  $(a+b)^2 = a^2 + 2ab + b^2$  ← must be true

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

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Ex 2 Factor the following completely

$$\begin{array}{l} \text{a) } m^2 - 10m + 25 \\ \quad \uparrow \quad \quad \quad \uparrow \\ \quad m \quad \quad \quad 5 \\ = (m - 5)^2 \end{array}$$

$$\begin{array}{l} \text{b) } y^2 + 2y + 1 \\ \quad \uparrow \quad \quad \quad \uparrow \\ \quad y \quad \quad \quad 1 \\ = (y + 1)^2 \end{array}$$

$$\begin{array}{l} \text{c) } 4x^2 + 28x + 49 \\ \quad \uparrow \quad \quad \quad \uparrow \\ \quad 2x \quad \quad \quad 7 \\ = (2x + 7)^2 \end{array}$$

$$\begin{array}{l} \text{d) } 16a^2 - 24a + 9 \\ \quad \uparrow \quad \quad \quad \uparrow \\ \quad 4a \quad \quad \quad 3 \\ = (4a - 3)^2 \end{array}$$

$$\begin{array}{l} \text{e) } x^2 - 18x + 81 \\ \quad \uparrow \quad \quad \quad \uparrow \\ \quad x \quad \quad \quad 9 \\ = (x - 9)^2 \end{array}$$

$$\begin{array}{l} \text{f) } x^4 - 8x^2 + 16 \\ \quad \uparrow \quad \quad \quad \uparrow \\ \quad x^2 \quad \quad \quad 4 \\ = (x^2 - 4)^2 \\ = ((x + 2)(x - 2))^2 \\ = (x + 2)(x - 2)(x + 2)(x - 2) \end{array}$$

Gizmo

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Ex 3. Factor the following completely

$$\begin{array}{l} \text{a) } 4m^2 + 20 \\ = 4(m^2 + 5) \end{array}$$

$$\begin{array}{l} \text{b) } 6y^2 + 24y - 72 \\ = 6(y^2 + 4y - 12) \quad \begin{array}{l} M - 12 \\ A \quad 4 \end{array} \\ = 6(y + 6)(y - 2) \quad \begin{array}{l} N - 2 \quad 6 \end{array} \end{array}$$

$$\begin{array}{l} \text{c) } 9a^3 - a \\ = a(9a^2 - 1) \\ = a(3a + 1)(3a - 1) \end{array}$$

$$\begin{array}{l} \text{d) } 2y^2 - 98 \\ = 2(y^2 - 49) \\ = 2(y - 7)(y + 7) \end{array}$$

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FBUHL

~~Homework~~

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**C1, C2, 2, 4, 6, 7, 8acf, 10, 12, 15, 16, 20bcef**



Get your thinking cap on!

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