

Name: _____ Hour: _____ Date: _____

Similar to our special product patterns, there are special factoring patterns.

• Difference of Two Squares:

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

Example: $x^2 - 25 = (x+5)(x-5)$

↑ ↑

$(x)^2 - (5)^2$

Example #1: Factor the expression.

1. $x^2 - 4$

↑ ↑

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

$(x+2)(x-2)$

2. $9a^2 - 64$

↑

$(3a)^2 - (8)^2$

$(3a+8)(3a-8)$

You practice: Factor the expression.

1. $m^2 - 9$

↑ ↑

$(m)^2 - (3)^2$

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

2. $4p^2 - 25$

↑ ↑

$(2p)^2 - (5)^2$

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

Example #2: Factor the expression.

1. $50 - 98x^2$

$$2(25 - 49x^2)$$

$$\begin{matrix} \uparrow & \uparrow \\ (5)^2 & - (7x)^2 \end{matrix}$$

$$\boxed{2(5 + 7x)(5 - 7x)}$$

2. $2x^2 - 32$

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

$$\begin{matrix} \uparrow & \uparrow \\ (x)^2 & - (4)^2 \end{matrix}$$

$$\boxed{2(x + 4)(x - 4)}$$

You practice: Factor the expression.

1. $18x^2 - 128$

$$2(9x^2 - 64)$$

$$\begin{matrix} \uparrow & \uparrow \\ (3x)^2 & - (8)^2 \end{matrix}$$

$$\boxed{2(3x + 8)(3x - 8)}$$

2. $1000 - 10m^2$

$$10(100 - m^2)$$

$$\begin{matrix} \uparrow & \uparrow \\ (10)^2 & - (m)^2 \end{matrix}$$

$$\boxed{10(10 + m)(10 - m)}$$

Example #3: Solve the equation by factoring.

1. $x^2 - 36 = 0$

$$\begin{matrix} \uparrow & \uparrow \\ (x)^2 & - (6)^2 \end{matrix}$$

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

$$x + 6 = 0$$

$$\boxed{x = -6}$$

$$x - 6 = 0$$

$$\boxed{x = 6}$$

2. $2x^2 - 32 = 0$

$$2(x^2 - 16) = 0$$

$$\begin{matrix} \uparrow & \uparrow \\ (x)^2 & - (4)^2 \end{matrix}$$

$$2(x + 4)(x - 4) = 0$$

$$x + 4 = 0$$

$$\boxed{x = -4}$$

$$x - 4 = 0$$

$$\boxed{x = 4}$$

You practice: Solve the equation by factoring.

1. $25x^2 - 4 = 0$

$$\begin{matrix} \uparrow & \uparrow \\ (5x)^2 & - (2)^2 \end{matrix}$$

$$(5x + 2)(5x - 2) = 0$$

$$5x + 2 = 0$$

$$5x = -2$$

$$\boxed{x = -2/5}$$

$$5x - 2 = 0$$

$$5x = 2$$

$$\boxed{x = 2/5}$$

2. $3x^2 - 27 = 0$

$$3(x^2 - 9) = 0$$

$$\begin{matrix} \uparrow & \uparrow \\ (x)^2 & - (3)^2 \end{matrix}$$

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

$$x + 3 = 0$$

$$\boxed{x = -3}$$

$$x - 3 = 0$$

$$\boxed{x = 3}$$