M10 - 5.4 - Differences of Squares Notes

Differences of Squares: A Subtraction Sign in Between two Squared Things

$$x^2 - 9$$

(+)(-)

Step 1 Set Up Two Sets of Brackets with a +(Plus) and a - (Minus) Sign.

(x +)(x -)

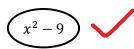
Step 2 What squared is x^2 ? x. That answer goes first in each set of brackets.

(x+3)(x-3)

Step 3 What squared is 9? 3. That number goes second in each set of brackets.

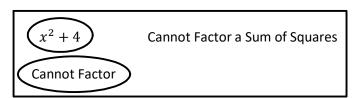


 $x^2 - 3x + 3x - 9$



In your Head

FOIL



$$4x^2 - 36$$

 $4(x^2 - 9)$

GCF

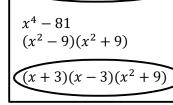
$$4(x+3)(x-3)$$

Factor

$$4(x+3)(x-3) 4(x^2-3x+3x-9) 4(x^2-9)$$

$$4(x^2-9)$$

FOIL



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

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

 $x^4 - 1$

$$x^4 = x^2 \times x^2$$
Factor Twice

$$\begin{vmatrix} a^4 - b^4 \\ (a^2 + b^2)(a^2 - b^2) \\ (a^2 + b^2)(a + b)(a - b) \end{vmatrix}$$

$$\boxed{4x^2-36}$$

$$4x^2 - 49$$
$$(2x)^2 - 7^2$$

Figure Out what is being Squared

Change of base

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

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

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

$$(2x+7)(2x-7)$$

Do this in your Head

Factor

(3x + y)(3x - y)

Factor

FOIL

$$(2x+7)(2x-7) 4x^2 - 14x + 14x - 49$$

FOIL

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

 $9x^2 - 3xy + 3xy - y^2$





$$-x^2 + 49$$

 $4x^2 - 49$

 $49 - x^2$

Rearrange

$$49 - x^{2}$$

$$-(-49 + x^{2})$$

$$-(x^{2} - 49)$$

GCF = -1Rearrange

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

Factor

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

Factor

$$(7+x)(7-x) 49-7x+7x-x^2$$

FOIL

$$-(x^2 + 7x - 7x - 49)$$
 FOIL $-(x^2 - 49)$

$$-x^2 + 49$$

$$49 - x^2$$

 $(1-x^{10})$ $(1-x^5)(1+x^5)$

$$\boxed{49-x^2}$$