

## 5.4 Factoring Difference of Squares

### REVIEWING FOIL

1.  $(x + 5)(x-5)$

2.  $(y + 4)(y-4)$

3.  $(3x-1)(3x+1)$

4.  $(w + 3)(w-3)$

5.  $(6m + 5)(6m-5)$

6.  $(3w + 4)(3w - 4)$

Perfect Squares: 1, 4, 9, 16, 25, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 144...

$x^2, x^4, x^6, \_\_\_\_\_, \_\_\_\_\_ \dots$

Determine whether each of the following is a difference of squares.

1.  $x^2 - 36$

2.  $x^6 - 81$

3.  $x^2 + 100$

4.  $-1 + 49x^2$

Factor the following:

Examples:  $y^2 - 16 = (y + 4)(y-4)$

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

$x^2 + y^2 =$

Check by

using FOIL: Ex:  $(y + 4)(y-4) = y^2 - 4y + 4y - 16 = y^2 - 16$

Factor and check. If it will not factor, write "prime."

1.  $x^2 - 49$

2.  $x^2 - 36$

3.  $x^2 - 25$

4.  $x^2 - 64$

5.  $x^2 - 1$

6.  $x^2 - 100$

7.  $x^2 + 16$

8.  $25y^2 - 81$

9.  $64t^2 - g^2$

10.  $49y^2 - 1$

11.  $9x^2 - 25$

12.  $4h^2 - 5$

Factor and check. Remember to check for a common factor first!

EX:  $5w^2 - 45 = 5(w^2 - 9) = 5(w+3)(w-3)$

1.  $4x^2 - 4$

2.  $18y^2 - 8$

3.  $98x^2 - 200$

4.  $25x^2 - 16$

5.  $18y^3 - 8y$

6.  $5t^2 - 5g^2$

7.  $x^2y^2 - 64$

8.  $3x^3 - 27x$

9.  $6x^2 - 12$

**CHECK TO SEE IF THE BINOMIAL WILL FACTOR AGAIN:**

$$\begin{aligned} X^4 - Y^4 &= (X^2 + Y^2)(X^2 - Y^2) \\ &= (X^2 + Y^2)(X + Y)(X - Y) \end{aligned}$$

$$\begin{aligned} Y^4 - 1 &= (Y^2 + 1)(Y^2 - 1) \\ &= (Y^2 + 1)(Y + 1)(Y - 1) \end{aligned}$$

$w^4 - 81$

$x^4 - 16$

$5y^4 - 5$

10.  $y^4 - w^4$

11.  $2x^4 - 162$

12.  $y^4 - 100$

13.  $7y^4 - 7$

14.  $y^4 + x^4$

15.  $3x^4 - 48$