

HW: Perfect Square Trinomials/22-52 even  
(omit 44 and 46)

**Warm up:**

Simplify.

$$1) \underline{(x + 3)}^2 = (x+3)(x+3) = \underline{x^2 + 6x + 9}$$

$$2) (x - 5)^2 = x^2 - 10x + 25$$

$$3) (2x - 6)^2 = 4x^2 - 24x + 36$$

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

$$\textcircled{40} \quad 625x^4 - 1$$

$$(25x^2 + 1)(25x^2 - 1)$$

$$(25x^2 + 1)(5x + 1)(5x - 1)$$

$$\textcircled{4} \quad (9 - w)(9 + w)$$

$$81 - w^2$$

$$62 \quad 16x^5y^2 - xy^6$$

$$xy^2(16x^4 - y^4)$$

$$xy^2(4x^2 + y^2)(4x^2 - y^2)$$

$$xy^2(4x^2 + y^2)(2x + y)(2x - y)$$

44

$$m^{16} - 1$$

$$(m^8 + 1)(m^8 - 1)$$

$$(m^8 + 1)(m^4 + 1)(m^4 - 1)$$

$$(m^8 + 1)(m^4 + 1)(m^2 + 1)(m^2 - 1)$$

$$(m^8 + 1)(m^4 + 1)(m^2 + 1)(m + 1)(m - 1)$$

$$46 \quad 2a^4 - 18a^2$$

$$2a^2(a^2 - 9)$$

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

$$\textcircled{50} \quad 27a^3b - 12ab^4$$

$$3ab(9a^2 - 4)$$

$$3ab(3a+2)(3a-2)$$

$$\textcircled{12} \quad (7p+5q)(7p-5q)$$

$$49p^2 - 25q^2$$

$$(14) (2x + n^2)(2x - n^2)$$

$$4x^2 - n^4$$

$$(16) (3m^2 - 8n^2)(3m^2 + 8n^2)$$

$$9m^4 - 64n^4$$

$$\textcircled{42} \quad 81s^4 - 16t^8$$

$$(9s^2 + 4t^4)(9s^2 - 4t^4)$$

$$\textcircled{(9s^2 + 4t^4)(3s + 2t^2)(3s - 2t^2)}$$

34

$$81n^2 - 121$$

$$(9n + 11)(9n - 11)$$



$$\textcircled{2} (m+8)(m-8)$$
$$m^2 - 64$$

$$\textcircled{3} (7+2a)(7-2a)$$
$$49 - 4a^2$$

 Multiply Polynomials.gsp

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

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

How can we tell if a trinomial is a perfect square trinomial?

1) First term is a perfect square

2) Last term is a perfect square

3) The middle term is twice the product of the square roots

$$x^2 + 12x + 36$$

The diagram illustrates the factoring process. The quadratic expression  $x^2 + 12x + 36$  is shown at the top. Three green arrows point downwards from the terms to the corresponding terms in the factored form  $(x + 6)^2$ . The first arrow points from  $x^2$  to  $x$ , the second from  $+$  to  $+$ , and the third from  $36$  to  $6^2$ . The entire factored expression  $(x + 6)^2$  is enclosed in a green oval.

$$2 \cdot 6x$$

$$x^2 - 8x + 16$$

$$(x - 4)^2$$

$$9x^2 - 12x + 4$$

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

$$8x^2 + 8x + 2$$

$$2(4x^2 + 4x + 1)$$

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

$$(2x + 1)(2x + 1)$$

$$4x^2 + 2x + 2x + 1$$

$$4x^2 + 4x + 1$$

Factor each trinomial if it is a perfect square. If not, write *not a perfect square*.

1)  $p^2 - 14p + 49$

$$(p-7)^2$$

2)  $121 - 22u + u^2$

$$(11-u)^2$$

3)  $4x^2 + 9 + 12x$

$$4x^2 + 12x + 9$$

$$(2x+3)^2$$

4)  $25x^2 - 15xy + 36y^2$

not a perfect square

5)  $4s^2 - 36st + 81t^2$

$$(2s-9t)^2$$

6)  $a^2b + 6ab^2 + 9b^3$

$$b(a^2 + 6ab + 9b^2)$$

$$= b(a+3b)^2$$

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

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

$$(x)^2$$

$$a^2 - 2a + 1$$

$$(a-1)^2$$