Algebra 2

Ch. 5 Handout 5.4

Factoring Quadratic Expressions

A perfect square trinomial is

Pull

the product you obtain when you square a binomial

* both ( )( ) are the same

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

The difference of two square is

Pull

an expression of the form $a^2 - b^2$.
It can be factored as
(a - b)(a + b).

* must be binomial
* must be subtraction
* Both terms must be Perfect Squares

Factoring Perfect Square Trinomials

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

Example: $x^2 + 6x + 9 = (x)^2 + 2(x)(3) + (3)^2 = (x+3)(x+3) = (x+3)^2$

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

Example: $x^2 - 6x + 9 = (x)^2 - 2(x)(3) + (3)^2 = (x-3)(x-3) = (x-3)^2$

Factoring Difference of Two Squares

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

Example: $9x^2 - 16 = (3x-4)(3x+4)$

Factoring a Perfect Square Trinomial

2. Factor $100x^2+180x+81$

$(10x)^2 \quad 2(10x)(9) \quad (9)^2$

$100x^2 + 180x + 81$

$(10x+9)(10x+9)$

$(10x+9)^2$

Factoring a Perfect Square Trinomial

3. Factor $9x^2 - 42x + 49$

$(3x)^2 \quad 2(3x)(7) \quad (7)^2$

$9x^2 - 42x + 49$

$(3x - 7)(3x - 7) = (3x-7)^2$

$-21x - 21x = -42x$

Factoring a Perfect Square Trinomial

$(5x)^2 \quad 2(5x)(9) \quad (9)^2$

3. Factor $25x^2+90x+81$

$(5x+9)(5x+9) = (5x+9)^2$

Factoring Difference of Two Squares

4. $x^2 - 64$

$(x)^2 - (8)^2$

$(x - 8)(x + 8)$

5. $4a^2 - 49$

$(2a)^2 - (7)^2$

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

$(3c)^2 - (4)^2$

6. $9c^2 - 16$

$(3c-4)(3c+4)$

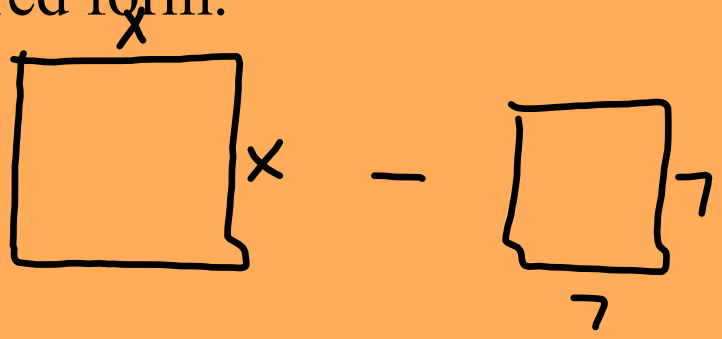
Factor: $\frac{12x^3}{3x} - \frac{75x}{3x}$

$(2x)^2 \quad (5)^2$

$3x(4x^2 - 25)$

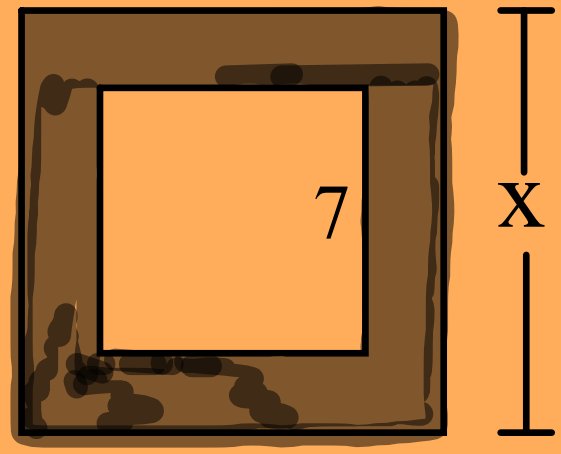
$3x(2x-5)(2x+5)$

A square photo is enclosed in a square frame, as shown in the diagram. Express the area of the frame (the shaded area) in completely factored form.



$x^2 - 49$

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



Factor each expression completely.

8. $12x^2 + 6x + 18$

6 6 6

$6(2x^2 + x + 3)$

9. $m^2 + 11m + 18$

$(m+9)(m+2)$

$2m + 9m = 11m$

Factor each expression completely.

10. $x^2 - 14x - 15$

$(x-15)(x+1)$

$x - 15x = -14x$

11. $x^2 - 13x + 42$

$(x-7)(x-6)$

$-6x - 7x = -13x$

Factor each expression completely.

$(8x)^2 \quad 2(8x)(9) \quad (9)^2$

12. $64x^2 + 144x + 81$

$(8x+9)(8x+9) = (8x+9)^2$

13. $3x^2 + 5x - 50$

$(3x - 10)(x + 5)$

$15x - 10x = 5x$

Factor each expression completely.

14. $5k^2 - 125$

$\frac{5k^2}{5} - \frac{125}{5}$

$(k)^2 \quad (5)^2$

$5(k^2 - 25)$

$5(k-5)(k+5)$

15. $15n^2 - 8n + 1$

$(5n-1)(3n-1)$

$-5n - 3n = -8n$

Assignment:

Day 2 pgs 263-265 2,5,8,11,14,17,20,23,26,29,32,35
37-47 odds, 51-65 odds