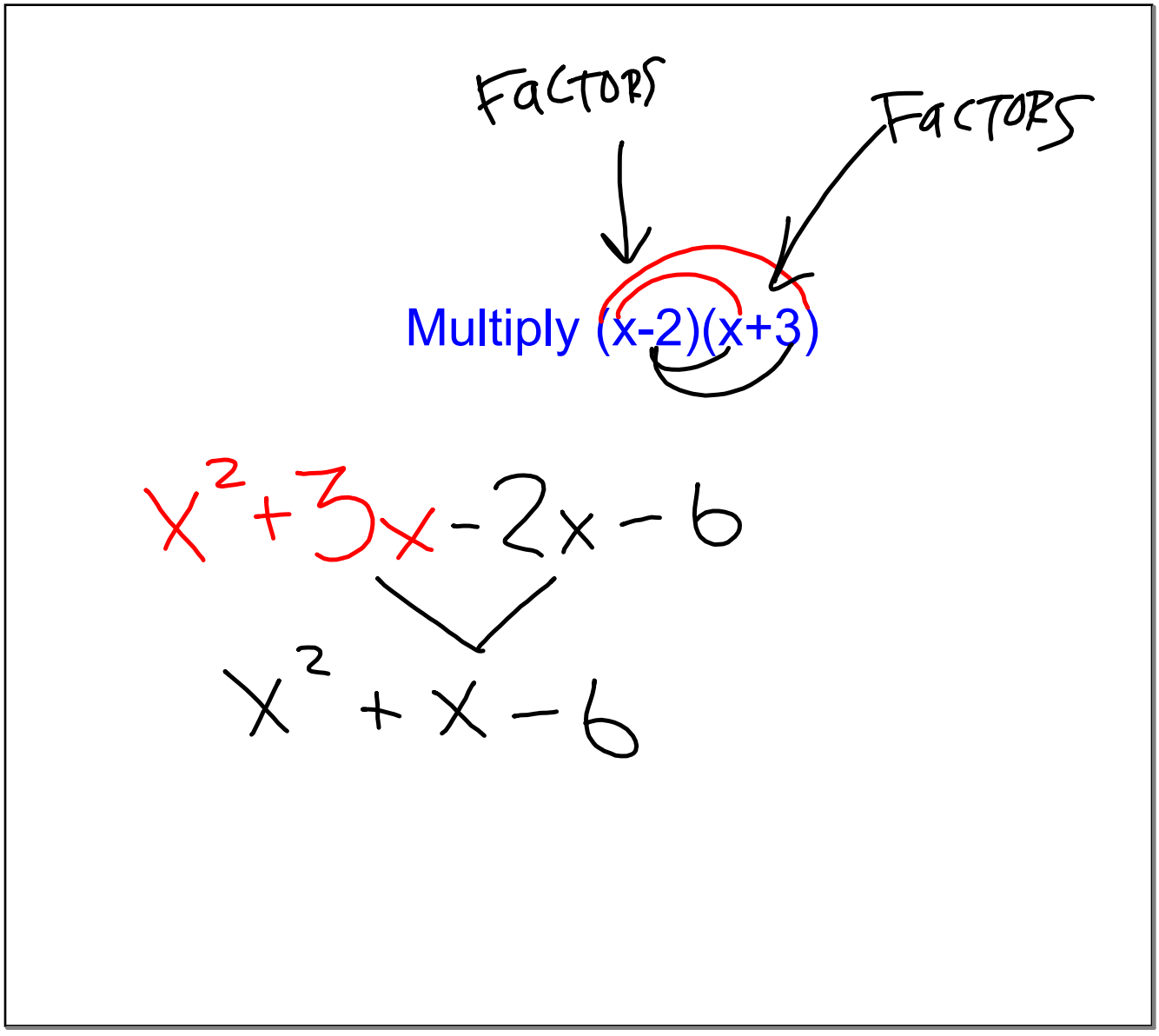
2-3 Factoring Review

Objectives:

1. Factor out the greatest common factor.
2. Factoring quadratic expressions in standard form
3. Finding the zeroes of a polynomial


FACTORS
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Multiply (x-2)(x+3)
$x^2+3x-2x-6$
x^2+x-6

To factor an expression containing two or more terms, factor out the *greatest common factor* (GCF)

Factor each quadratic expression.

a. $5x^2 + 4x$

$x(5x+4)$

b. $3ax^2 - 6a^2x$

$3ax(x-2a)$

Factoring $x^2 + bx + c$

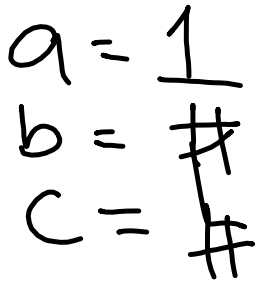
To factor an expression of the form $ax^2 + bx + c$, where $\boldsymbol{a = 1}$

Ask yourself 2 questions:

1. What two numbers multiply to make c?

AND

2. What two numbers add to make b?



Factor each quadratic expression.

a. $x^2 + 5x + 4$

$a = 1$
$b = 5$
$c = 4$

4

1 + 4 = 5	
~~2 + 2 = 4~~	

$x^2 + 5x + 4$

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

$x(x+1) + 4(x+1)$

$(x+4)(x+1)$

b. $x^2 + 6x + 8$

$a = 1$
$b = 6$
$c = 8$

8

2 + 4 = 6	
8 | 1	

$x^2 + 6x + 8$

$(x^2 + 2x)(4x + 8)$

$x(x+2) + 4(x+2)$

$(x+4)(x+2)$

Factor each quadratic expression.

c. $x^2 - 7x + 10$

$a = 1$

$b = -7$

$c = 10$

10
$-5 \mid -2$

$x^2 - 5x - 2x + 10$

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

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

d. $x^2 - 2x - 8$

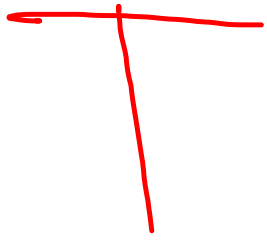
-8
$-4 \mid 2$
$-2 \mid 4$

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

Factoring $x^2 + bx + c$

To factor an expression of the form $ax^2 + bx + c$, where a = **not 1**

1. Multiply a and c
2. Find factors of the product of ac that add to give you b
3. Rewrite your polynomial using the numbers you found in step 2 to break up b into two terms.
4. Find the GCF by grouping
5. Write out binomials



Factor each expression

$2x^2 + 13x + 15$

$a = 2$

$b = 13$

$c = 15$

30

15 | 2

5 | 6

10 + 3 = 13

$2x^2 + 13x + 15$

$(2x^2 + 10x) + (3x + 15)$

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

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

$2x^2 + 10x + 3x + 15$

$13x$

$6x^2 + 11x + 3$

$(6x^2 + 9x)(2x + 1)$

$3x(2x+3) + 1(2x+3)$

$(3x+1)(2x+3)$

$6x^2 + 9x + 2x + 3$

✓

Factor each expression.

$3x^2 + 11x - 20$

$3x^2 - 4x + 15x - 20 \quad -60$

$x(3x-4) + 5(3x-4)$

-4	15
2	30
3	20

$(x+5)(3x-4)$

$4x^2 - 13x + 3$

$a = 4$

$b = -13$

$c = 3$

-12	-1

$4x^2 - 13x + 3$

$(4x^2 - 12x)(-1x + 3)$

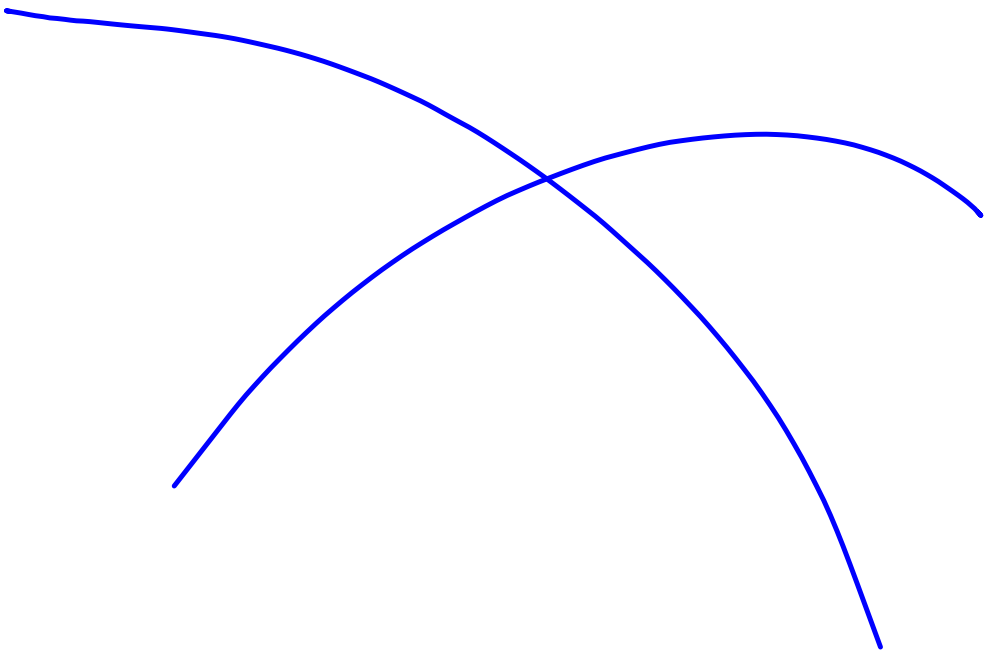
$4x(x-3) - 1(x-3)$

$(4x-1)(x-3)$

Factor each quadratic expression.

$56 + 10x - x^2$

$35 - 12x + x^2$



Solve each equation by factoring.

$x^2 - 4x - 21 = 0$

$(x^2 - 7x) + 3x - 21 = 0$

$x(x-7) + 3(x-7) = 0$

$(x+3)(x-7) = 0$

$a \cdot b = 0$

$x+3=0 \quad x-7=0$

$x=-3 \quad x=7$

$x=-3, 7$

$x^2 + 3x - 4 = 0$

$x^2 + 4x - x - 4$

$(x+4)(x-1) = 0$

$x=-4, 1$

zeroes

Use factoring to find the zeros of each quadratic function.

$h(x) = x^2 - 12x$

$x^2 - 12x = 0$

$a \cdot b = 0$

$x(x-12) = 0$

$x = 12, 0$

$g(x) = 2x^2 + 17x - 9$

-18

$18 \mid -1$

$(2x^2 + 18x) - x - 9$

$2x(x+9) - 1(x+9)$

$(2x-1)(x+9) = 0$

$(1/2)$

$2x - 1 = 0$

$+1 \quad +1$

$2x = 1$

$\frac{2}{2} = \frac{}{2}$

$x = 1/2$

$x + 9 = 0$

$x = -9$

$x = -9, 1/2$

Write an equation with given zeros.

a. x=1, x=2

b. x= -7,3

Write an equation with given zeros.

c. x= 0,4

d. The zeros are -9 and 1