$x^2 + 11x + 30$

$(x+6)(x+5)$

$x^2 - 10x + 24$

$(x-6)(x-4)$

$x^2 + x - 12$

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

$x^2 - 5x - 36$

$(x-9)(x+4)$

WARM UP

FACTORING
$F(X) = AX^2 + BX + C$

Cubic Houses (Rotterdam, Netherlands)

Goals Aligned to Common Core Standards

You will recognize ways to rewrite an expression.

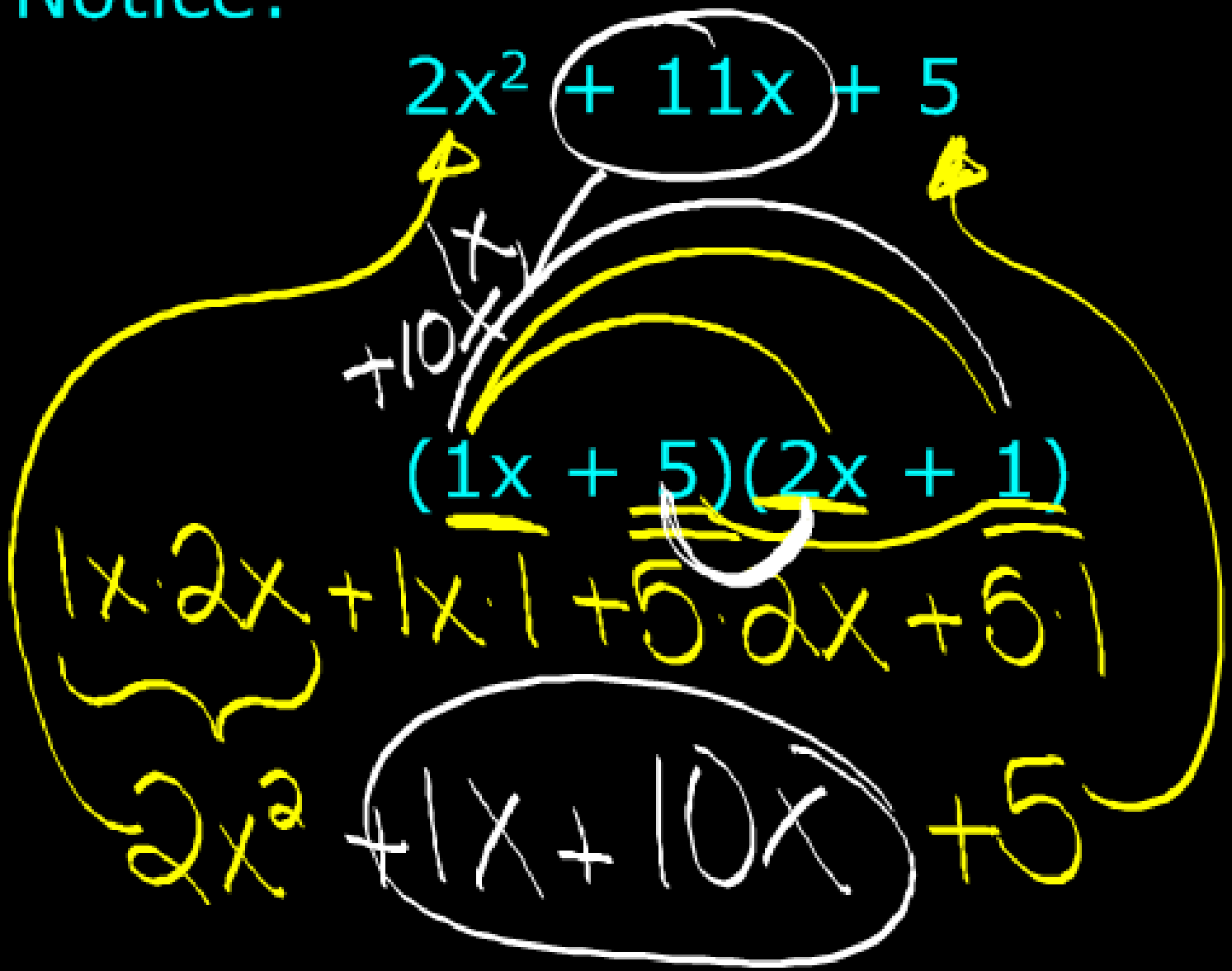
You will solve quadratic equations by factoring of the form $f(x) = ax^2+bx+c$ by inspection.

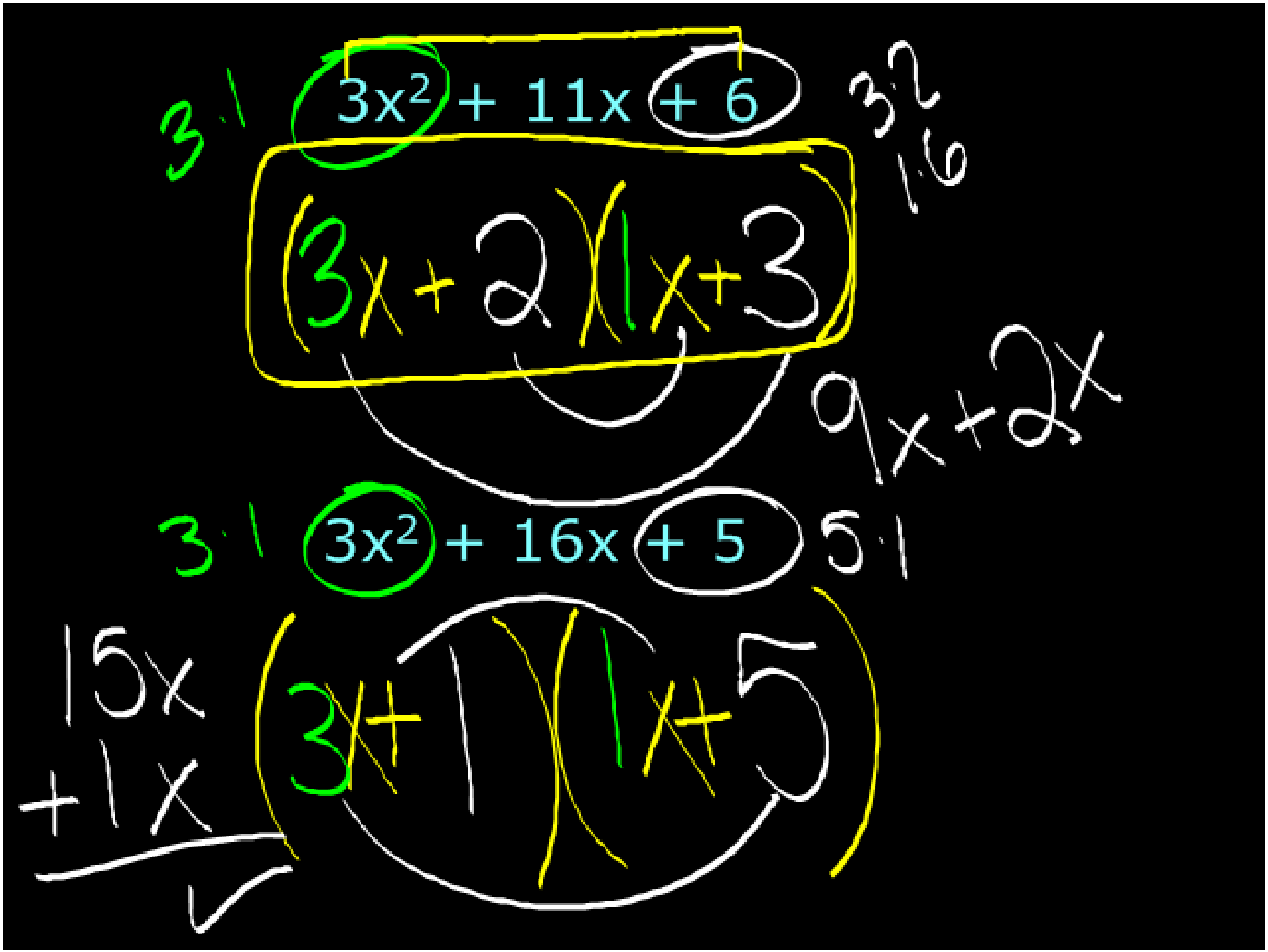
You will use the process of factoring in a quadratic function to reveal the zeros by solving quadratic equations.

You will interpret parts of an expression (factors).

Factoring $y = ax^2 + bx + c$:

Notice:

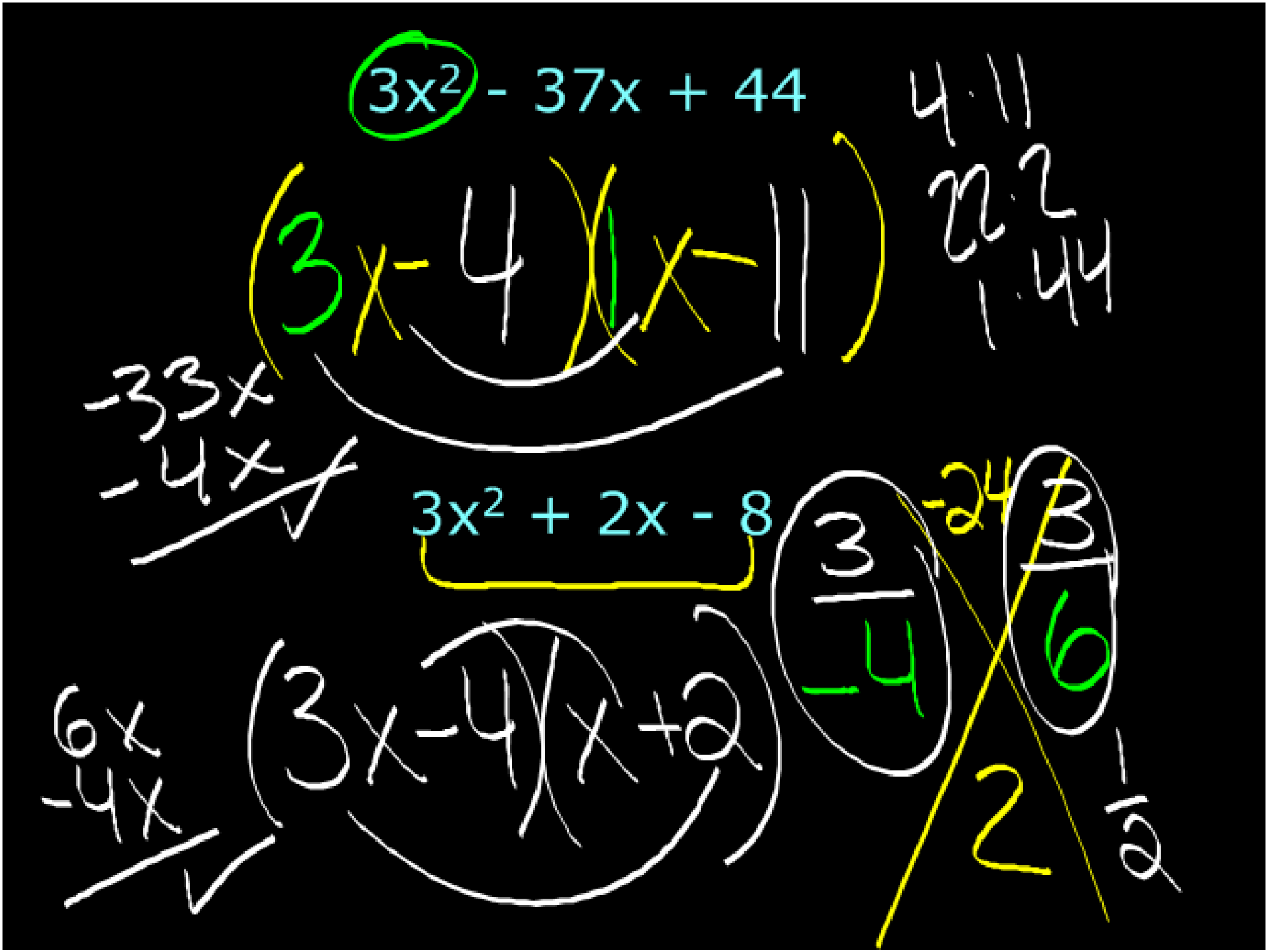



3 · 1
3x² + 11x + 6
3 · 2
1 · 6
(3x + 2)(1x + 3)
9x + 2x
3 · 1
3x² + 16x + 5
5 · 1
15x
+1x
(3x + 1)(1x + 5)

Could we have used factoring by GCF?

by grouping?

by x^2+bx+c?


3x² - 37x + 44
(3x - 4)(x - 11)
4 · 11
22 · 2
1 · 44
-33x
-4x
3x² + 2x - 8
3
-4
-24
3
6
2
-12
6x
-4x
(3x - 4)(x + 2)

$5w^2 - 9w - 2$

$(5w+1)(1w-2)$

$-10w$
$1w$
$-9w$

$2x^2 + 19x - 10$

$5 \cdot 2$
$10 \cdot 1$

$-20x$
$1x$

$(2x-1)(x+10)$

Find the solutions.

$2x^2 + 9x + 9 = 0$

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

$x = -3$

$1 \cdot 18 = 18$, $2 \cdot 9 = 18$, $3 \cdot 6 = 18$

$2x+3$

$2x = -3$

$\frac{2x}{2} = \frac{-3}{2}$

$x = -\frac{3}{2}$

$\left(-\frac{3}{2}, -3\right)$

$5x^2 + 27x + 10 = 0$

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

$5x+2=0$

$\frac{5x}{5} = \frac{-2}{5}$

$x = -\frac{2}{5}$

$x+5=0$

$x = -5$

$\left(-\frac{2}{5}, -5\right)$

$2x^2+9x+9$

$18 \quad 9$

$18 = 6 \times 3$

$9 = 3 \times 3$

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

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

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

Why are quadratics used, and why do we solve for it's zeros?

Balls, Arrows, Missiles and Stones
If you throw a ball (or shoot an arrow, fire a missile or throw a stone) it will go up into the air, slowing down as it goes, then come down again ...
A quadratic equation can be written to represent these items. We can use it to see the time it takes to hit the ground, the height it reaches, or the distance it traveled. Very important in the military!
If you want to put a new item on the market, a quadratic equation can help you determine what price you should sell your product for to help you make the most profit.
Satellite dishes use a parabolic shape (a quadratic!) in order to receive information. Here is an example of how it works.
http://olc.spsd.sk.ca/DE/math20/math20trailolc/quad_equation/equation_2.html
Many more examples and details about each at:
http://www.mathsisfun.com/algebra/quadratic-equation-real-world.html

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Hang Nga Guesthouse a.k.a Crazy House (Vietnam)