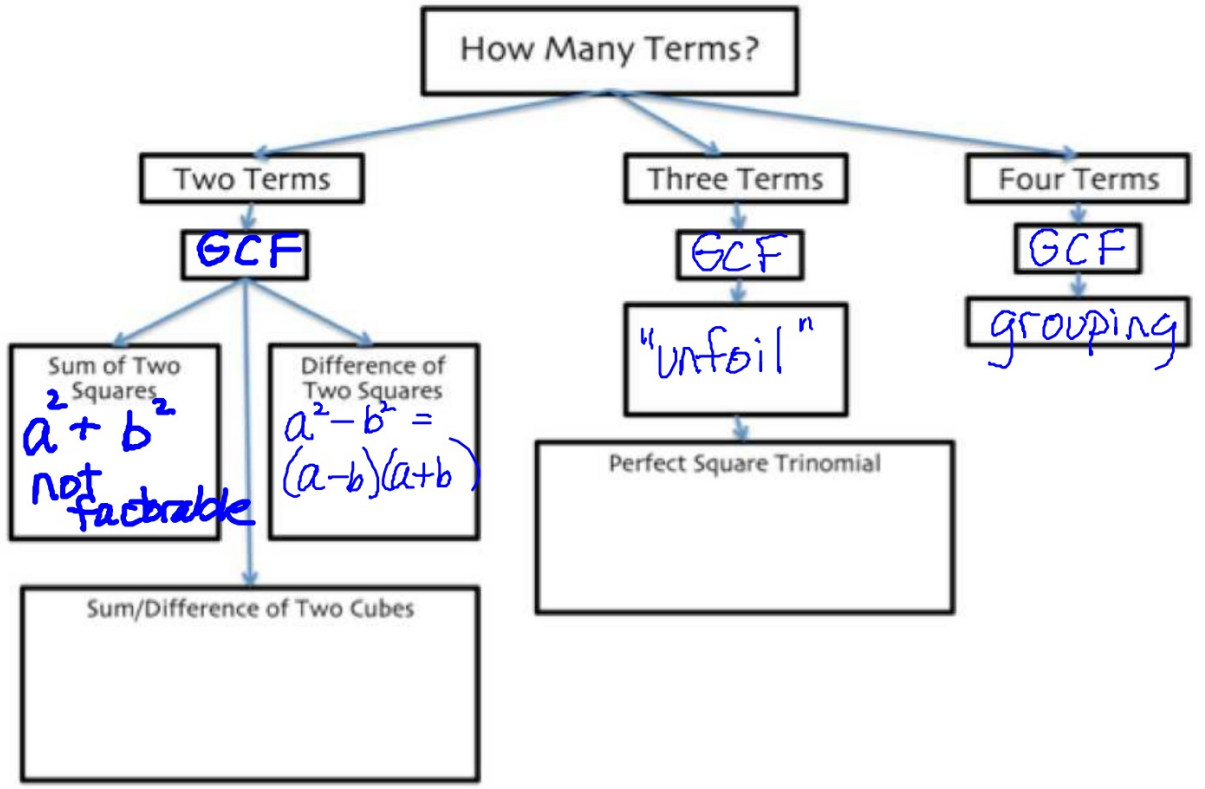
Factoring Bootcamp

"Algebra class will be important to you later in life because there's going to be a test six weeks from now."

Factoring Flowchart



"GCF" –
"SOAP" –
Prime –

Two Terms

Sum/Difference of Squares

$$a^2 + b^2 =$$

$$a^2 - b^2 =$$

ex: Factor completely.

a) $x^2 - 49$

9

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

b) $x^2 - 16$

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

c) $x^2 + 1$ not factorable or prime

d) $4y^2 - 1$

$(2y-1)(2y+1)$

e) $2x^2 - 50$

$2(x^2-25)$

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

f) $x^2 - 9x$

$x(x-9)$

g) $144 - x^2$

$(12 - x)(12 + x)$

$-(x^2 - 144)$

$-(x+12)(x-12)$

h) $x^4 - 81$

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

$(x+3)(x-3)(x^2+9)$

Four Terms

ex: Factor completely.

a) $12x^3 + 2x^2 - 30x - 5$

$2x^2(6x+1) - 5(6x+1)$

$(6x+1)(2x^2-5)$

b) $x^3 + x^2 + 4x + 4$

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

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

$(x+2)^2 \neq x^2 + 4$

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

$x^2 + 4x + 4$

c) $9x^3 - 9x^2 - 4x + 4$

$9x^2(x-1) - 4(x-1)$

$(x-1)(9x^2-4)$

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

Three Terms

Perfect Square Trinomial

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

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

ex: Factor completely.

a) $x^2 - 10x + 9$ $-9, -1$

$(x-9)(x-1)$

b) $x^2 - 2x - 8$

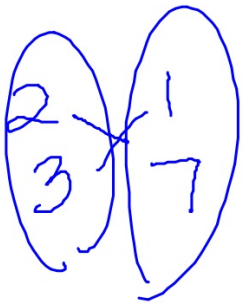
$(x-4)(x+2)$

c) $x^2 - 9x + 10$ $-10, -1$

Not factorable $1, -10$

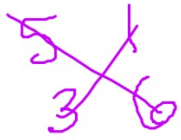
d) $2x^2+17x+21$

$(2x+3)(1x+7)$



14, 3

e) $5x^2-1x-18$



$(5x+9)(x-2)$

10 9

f) $10x^2 + 13x - 30$

$(5x-6)(2x+5)$

g) $9y^2 + 6y + 1$ $(3y+1)^2$

h) $2x^2 + 2x - 24$

$2(x+4)(x-3)$

Mixed Practice

ex: Factor completely.

a) $x^3 + 16x$ $x(x^2 + 16)$

b) $3y^2 + 17y - 6$ $(3y - 1)(y + 6)$

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

w) $2(4x+3)(x-1)$

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

y) $3x^2(3x^2-5)$