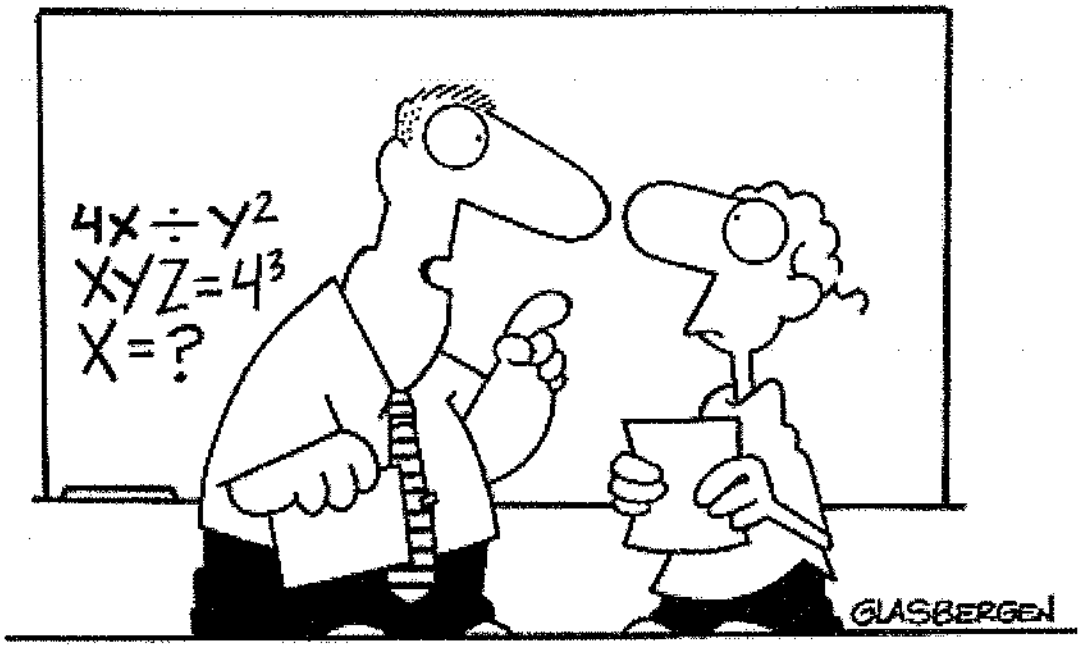
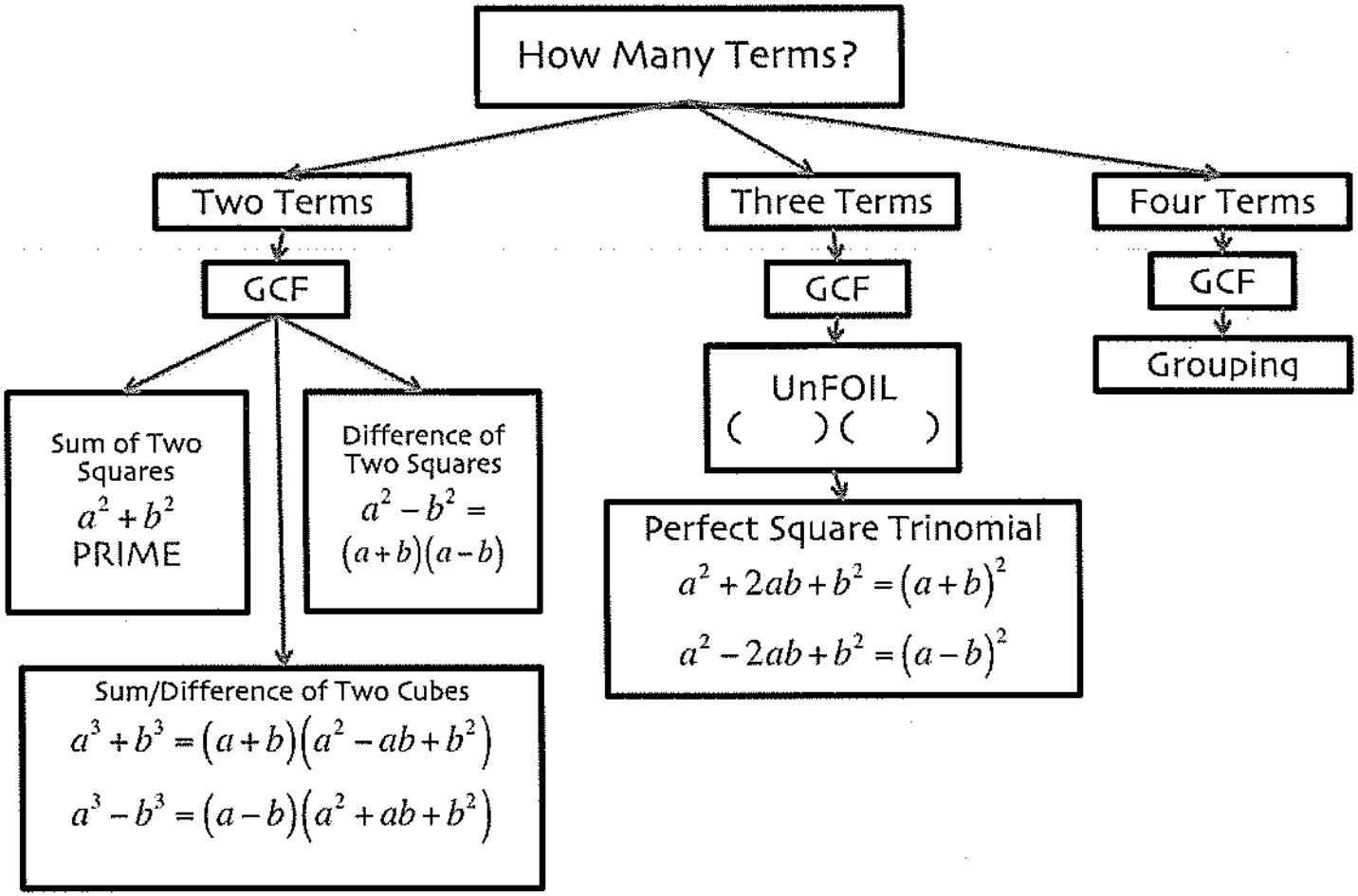
Factoring Bootcamp - Day 4

Notes



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

*See printout.



"GCF" – Greatest Common Factor
"SOAP" – Same – Opposite – Always Positive
Prime – Doesn't Factor

Three Terms $ax^2+bx+c \quad a \neq 1$

Trinomial

- GCF 1st!!!
- "Unfoil"

( )( )

Perfect Square Trinomial (PST)

$$a^2+2ab+b^2 = (a+b)(a+b) = \boxed{(a+b)^2}$$

$$a^2-2ab+b^2 = (a-b)(a-b) = \boxed{(a-b)^2}$$

↑ always positive

(a−b)(a−b): Two of the same factor here.

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

+42

1 42

2 21

$\frac{2x}{+3}$ $\frac{2x}{+14}$ $\div 2$ $\frac{1x}{+7}$

$3\overline{)42}$ $\quad 14$

-3

12

no gcf

~~PST?~~

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

~~*~~ foil to check !

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

−90

1 90

2 45

3 30

$\frac{5x}{+9}$ $\frac{5x}{-10}$ $\div 5$ $\frac{1x}{-2}$

4

18

$\times 5$

90

no gcf

~~PST?~~

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

foil 2 ✓

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

no gcf

PST?

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

foil 2 ✓

-300

1	300
2	150
10	30
$10x$	$10x$
-12	$+25$
$\div 2$	$\div 5$
$5x$	$2x$
-6	$+5$

27 R 3

$11\overline{)300}$

-22

80

-77

3

25

$12\overline{)300}$

-24

60

-60

0

d) $9y^2 + 6y + 1$ ✓

no gcf

$(3y+1)(3y+1)$

foil 2 ✓

PST? YES

$(3y+1)^2$

$1^2 = 1$

e) $\frac{2x^2}{2} + \frac{2x}{2} - \frac{24}{2}$

gcf

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

$\boxed{2(x-3)(x+4)}$

foil 2✓

−12	
1	12
2	6
$\frac{1x}{-3}$	$\frac{1x}{+4}$

What if I forget to take out the GCF?

$2x^2 + 2x - 24$

$3\overline{)48}$ $\frac{16}{-3}$ $\frac{}{18}$

−48	
1	48
2	24
3	16 ✓
4	12
$\frac{2x}{-6}$	$\frac{2x}{+8}$
$\div 2$	$\div 2$
$\frac{1x}{-3}$	$\frac{1x}{+4}$

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

f) $2n^2 + 3n - 9$

-18

no gcf,

~~P/S?~~

$1 \quad 18$

$2 \quad 9$

$(2n-3)(n+3)$

foil 2 ✓

$2n - 3$

$2n + 6$

$\div 2$

$1n + 3$

✓

g) $2n^2 + 5n + 2$

$+4$

no gcf,

~~P/S?~~

$2n + 1$

$2n + 4$

$\div 2$

$1n + 2$

$(2n+1)(n+2)$

foil 2 ✓

h) $\frac{9k^2}{3} + \frac{66k}{3} + \frac{21}{3}$

$3\overline{)66}$ → 22, $-6\downarrow$, 06

yes

gcf:

$3(3k^2+22k+7)$

$+21$ ← $3k \times +1$, $3k + 21$, $\div 3$, $1k + 7$

not perfect square

$3(3k+1)(k+7)$

foil 2 ✓

i) $5x^2 - 18x + 9$

$+45$ ← 1×-3, 45×-15, $\div 5$, $1x - 3$ ✓

no gcf,

not perfect square

$(5x-3)(x-3)$

foil 2 ✓

$5x^2 - 15x - 3x + 9$

$-18x$ ✓

j) $4x^2 - 35xy + 49y^2$

ɔct

ɔst?

$(2x-7y)(2x-7y)$

foil 2 ✓

$4x^2 - 14xy - 14xy + 49y^2$

$-28xy$

$49 \times 4 = 196$

+196

1	196
4	49

$\frac{4x}{-7y}$ $\frac{4x}{-28}$ $\div 4$ $\frac{1x}{-7y}$

$196 \div 6$: 3, −18, 16

$196 \div 7 = 28$: −14, 56, −56, 0

$(4x-7y)(x-7y)$

foil 2 ✓

check for the back variable

k) $-6a^2 - 25a - 25$

$\frac{}{-1}$ $\frac{}{-1}$ $\frac{}{-1}$

negative

$-1(6a^2 + 25a + 25)$

+150

1	150
2	75

$\frac{6a}{+10}$ $\div 2$ $\frac{3a}{+5}$

$\frac{6a}{+15}$ $\div 3$ $\frac{2a}{+5}$

$-1(3a+5)(2a+5)$

foil 2 ✓

l) $3n^2 - 8n + 4$

no gcf, not perfect square

$+12$

$1 \quad 12$

$3 \quad 4$

$3n - 2$

$3n - 6 \div 3$

$1n - 2$

$(3n-2)(n-2)$

m) $7a^2 + 53a + 28$

no gcf, not perfect square

5
28
$\times 7$
196

$+196$

$1 \quad 196$

$2 \quad 98$

$7 \quad 28$

$7a + 4$

$7a + 49 \div 7$

$1a + 7$

50
45
$+3$
98

6
$3 \overline{)196}$
18
16

49
$4 \overline{)196}$
-16
36
-36
0

$(7a+4)(a+7)$

$7a^2 + 49a + 4a + 28$

$+53a$ ✓

Mixed Practice

ex: Factor completely.

NOT THESE:

$(x+4)(x+4) = x^2+8x+16$

$(x+4)(x-4) = x^2-16$

1) $\frac{x^3}{x} + \frac{16x}{x}$

gcf: x

$\boxed{x(x^2+16)}$

sum of two square is prime (does not factor)

2) $3y^2+17y-6$

-18

$3y \cdot -1$ and $3y \cdot +18$

$\div 3$

$1y \cdot +6$

no gcf,

not perfect square

$\boxed{(3y-1)(y+6)}$

3) $\frac{x^3}{x^2} + \frac{4x^2}{x^2} - \frac{x}{-1} - \frac{4}{-1}$

4 terms = grouping

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

$\sqrt{1} = 1$

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

DOS

$\boxed{(x+4)(x+1)(x-1)}$