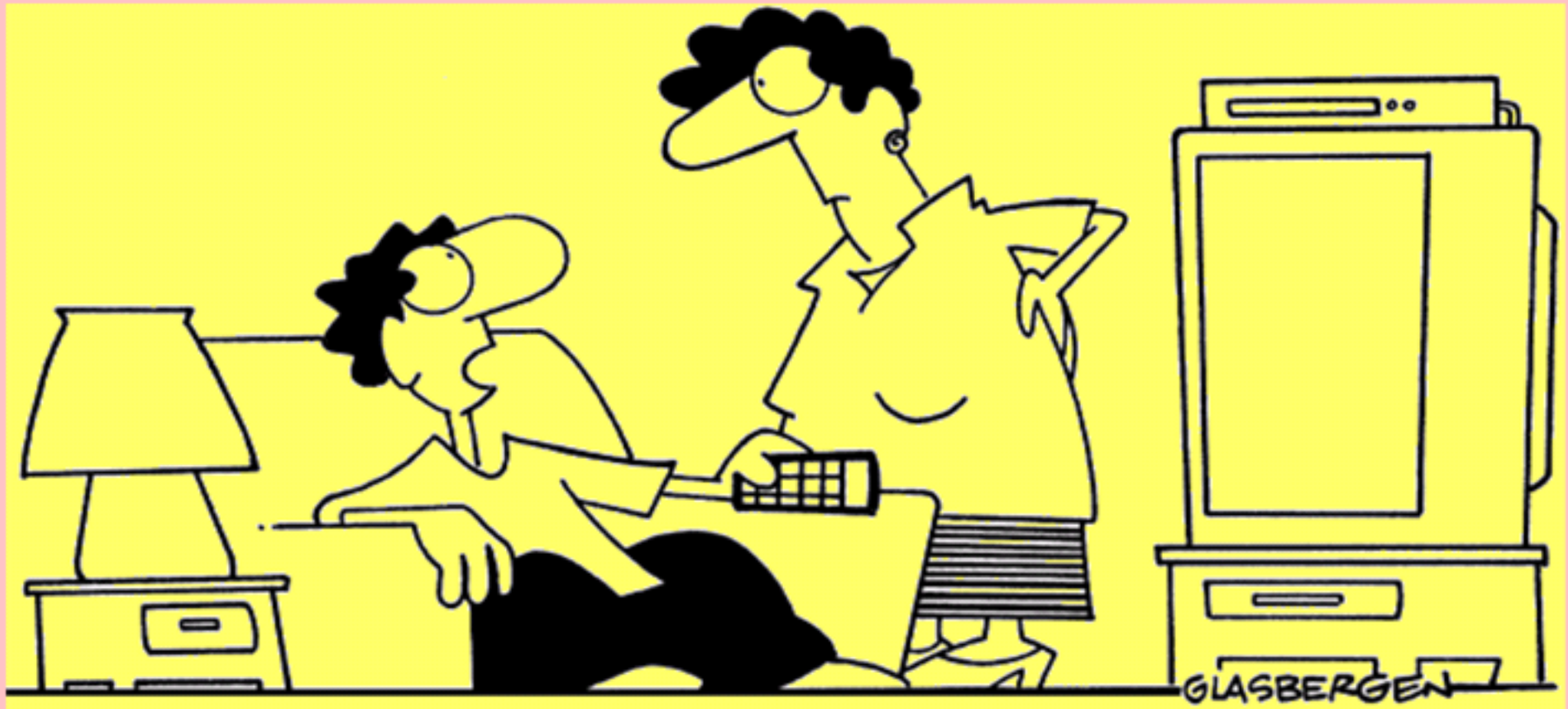
Factoring Trinomials



"IF I DO MY HOMEWORK, I'LL GET GOOD GRADES.
IF I GET GOOD GRADES, YOU'LL SEND ME TO COLLEGE.
IF I GO TO COLLEGE, I'LL GRADUATE AND GET A JOB.
IF I GET A JOB, I MIGHT GET FIRED. IF I GET FIRED,
I COULD GO BANKRUPT AND LOSE EVERYTHING.
THAT'S WHY I DIDN'T DO MY HOMEWORK!"

Multiply using the FOIL method

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

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

x^2+5x+6

2) $(a+1)(a+2)$

$a^2+2a+a+2$

a^2+3a+2

3) $(x+4)(x+6)$

$x^2+6x+4x+24$

$x^2+10x+24$

4) $(x+8)(x+9)$

$x^2+9x+8x+72$

$x^2+17x+72$

Study the products. Do you see a relationship between the product and the factors?

Factor these using the pattern.

1) $x^2 + 7x + 10$

5, 2
~~7, 10~~

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

2) $x^2 + 9x + 20$

5, 4
~~2 + 10~~
~~1 + 20~~

$(x+5)(x+4)$

3) $x^2 + 12x + 20$

$(x+10)(x+2)$

1, 24
2, 12
3, 8
4, 6

4) $x^2 + 11x + 24$

$(x+3)(x+8)$

5) $x^2 + 15x + 20$

$(x+\quad)(x+\quad)$

Prime

6) $x^2 + 13x + 42$

$(x+7)(x+6)$

$(+)(+) \rightarrow +$
$(-)(-) \rightarrow +$
$x^2 \; x^2$

Multiply these using the FOIL method:

x^2-5x+6

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

$x^2-2x-3x+6$

3) $(c-8)(c-4)$

$c^2-8c-4c+32$

$c^2-12c+32$

$t^2-5t-2t+10$

2) $(t-2)(t-5)$

$t^2-7t+10$

4) $(f-2)(f-9)$

$f^2-9f-2f+18$

$f^2-11f+18$

Study the products. Do you see a relationship between the product and the factors?

Factor these using that pattern.

1) $a^2 - 9a + 18$

$(a-3)(a-6)$

2) $x^2 - 26x + 25$

$(x-25)(x-1)$

3) $b^2 - 8b + 12$

$(b-6)(b-2)$

4) $x^2 - 19x + 34$

$(x-17)(x-2)$

5) $a^2 - 13a + 40$

$(a-8)(a-5)$

6) $x^2 - 19x + 48$

$(x-16)(x-3)$

Multiply these using FOIL.

$x^2+7x-4x-28$

1) $(x-4)(x+7)$

$x^2+3x-28$

$a^2+4a-10a-40$

2) $(a-10)(a+4)$

$a^2-6a-40$

3) $(a-3)(a+4)$

a^2+a-12

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

$x^2-7x-18$

5) $(r-5)(r+3)$

$r^2-2r-15$

6) $(x+9)(x-3)$

$x^2+6x-27$

Study the products. Do you see a relationship between the product and the factors? Also, study the operations in the product.

Factor these using that pattern:

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

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

2) $r^2 - 4r - 12$

$(r+2)(r-6)$

3) $s^2 - 2s - 15$

$(s+3)(s-5)$

4) $x^2 + x - 20$

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

5) $x^2 - 23x - 50$

$(x+2)(x-25)$

6) $x^2 + 16x - 48$

prime

7) $x^2 + 3x - 10$

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

8) $y^2 - 7y - 30$

$(y+3)(y-10)$

9) $a^2 + 13a - 48$

$(a+16)(a-3)$

Sort these trinomials according to the pattern

A	B	C
$(x + ?)(x + ?)$	$(x - ?)(x - ?)$	$(x + ?)(x - ?)$
$x^2 + 6x + 9$	$x^2 - 3x + 2$	$x^2 - 7x - 8$
$x^2 + 10x + 21$	$x^2 - x + 42$	$x^2 - 3x - 54$
$x^2 + 9x + 20$	$x^2 - 12x + 35$	
$x^2 + 10x + 24$	$x^2 - 13x + 36$	

(15) $2n^2+6n-108$

$2(n^2+3n-54)$

$\boxed{2(n+9)(n-6)}$

(17) $2k^2+22k+60$

$2(k^2+11k+30)$

$\boxed{2(k+5)(k+6)}$

$$(p-1)^2$$

$$(p-1)(p-1)$$