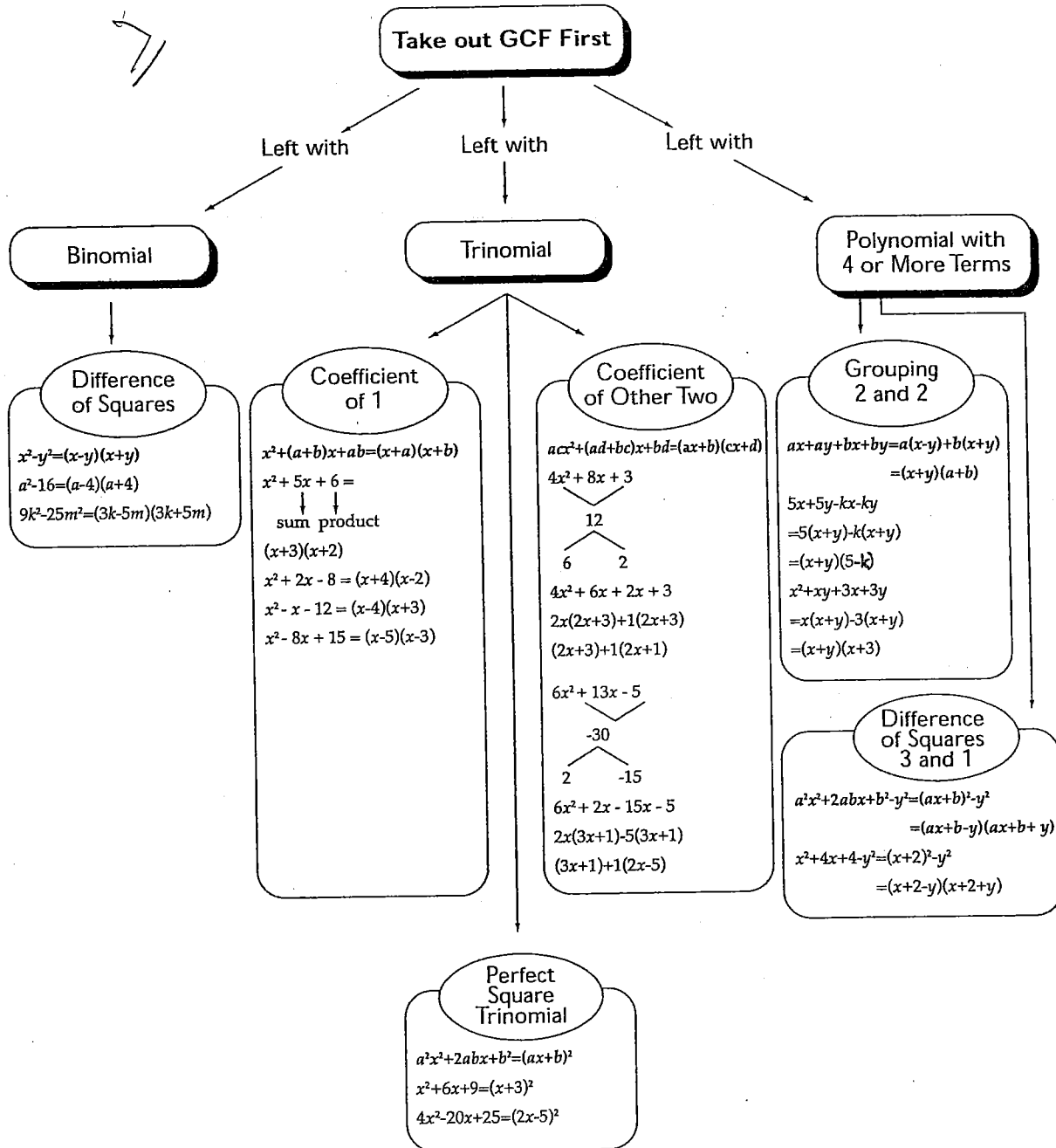


## FACTORING POLYNOMIALS



# Why Didn't Klutz Do Any Homework on Saturday?



Either multiply or factor, as directed, and find your answer in the adjacent answer column. Write the letter of that exercise in the box that contains the number of the answer.

**Multiply:**

- ①  $(a + 5)(a - 5)$
- ②  $(2 + 3a)(2 - 3a)$
- ③  $(7a - 1)(7a + 1)$
- ④  $(a^2 - 6)(a^2 + 6)$
- ⑤  $(4a + b)(4a - b)$
- ⑥  $(2a^2 - 5b)(2a^2 + 5b)$
- ⑦  $16a^2 - b^2$
- ⑧  $49a^2 - 1$
- ⑨  $a^2 - 25$
- ⑩  $4a^4 - 25b^2$
- ⑪  $4 - 9a^2$
- ⑫  $4a^4 - 36$
- ⑬  $a^4 - 36$

**Factor:**

- ①  $x^2 - y^2$
- ②  $4x^2 - 49y^2$
- ③  $81x^2 - 100y^2$
- ④  $36x^2 - 121y^2$
- ⑤  $9x^2 - 64y^2$
- ⑥  $x^4 - 400$
- ⑦  $(9x + 10y)(9x - 10y)$
- ⑧  $(x + y)(x - y)$
- ⑨  $(x^2 + 20)(x^2 - 20)$
- ⑩  $(6x + 11y)(6x - 11y)$
- ⑪  $(3x + 7y)(3x - 7y)$
- ⑫  $(2x + 7y)(2x - 7y)$
- ⑬  $(3x + 8y)(3x - 8y)$

**Factor:**

- ①  $(2n + 3)(2n - 3)$
- ②  $n^2 - 49$
- ③  $n^2 - 1$
- ④  $81 - n^2$
- ⑤  $4n^2 - 9$
- ⑥  $49n^2 - 16$
- ⑦  $144 - 25n^2$
- ⑧  $(12 + 5n)(12 - 5n)$
- ⑨  $(n + 1)(n - 1)$
- ⑩  $(7n + 3)(7n - 3)$
- ⑪  $(n + 7)(n - 7)$
- ⑫  $(9 + n)(9 - n)$
- ⑬  $(7n + 4)(7n - 4)$

**Factor:**

- ①  $a^6 - b^4$
- ②  $25a^8 - 9b^4$
- ③  $a^2b^2 - 36$
- ④  $16 - a^4b^6$
- ⑤  $a^2b^4 - c^8$
- ⑥  $4a^{16} - 225$
- ⑦  $(4 + a^2b^3)(4 - a^2b^3)$
- ⑧  $(2a^8 + 15)(2a^8 - 15)$
- ⑨  $(a^3 + b^2)(a^3 - b^2)$
- ⑩  $(ab^2 + c^4)(ab^2 - c^4)$
- ⑪  $(ab + 6)(ab - 6)$
- ⑫  $(5a^4 + 3b^2)(5a^4 - 3b^2)$
- ⑬  $(4 + ab^4)(4 - ab^4)$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
H	E	W	A	S	I	N	A	W	E	E	K	E	N	D	C	O	N	D	I	T	I	O	N

# A DRASTIC WAY TO DIET



AN EXTREME BUT EFFECTIVE WAY TO DIET IS HIDDEN IN THE LETTERS BELOW.  
TO FIND IT:

Factor each trinomial below. Find the factored form in the set of answers under the exercise and cross out the letter above it. When you finish, the diet will remain. You might call it the "Algebra diet."

- ①  $m^2 + 8m + 7(m+1)(m+7)$
- ②  $m^2 + 5m + 6(m+2)(m+3)$
- ③  $m^2 + 10m + 9(m+1)(m+9)$
- ④  $m^2 - 6m + 8(m-2)(m-4)$
- ⑤  $m^2 - 8m + 12(m-2)(m-6)$
- ⑥  $m^2 + 11m + 24(m+3)(m+8)$

- ⑦  $d^2 - 8d + 15(d-3)(d-5)$
- ⑧  $d^2 - 12d + 20(d-2)(d-10)$
- ⑨  $d^2 + 14d + 13(d+1)(d+13)$
- ⑩  $d^2 - 13d + 36(d-4)(d-9)$
- ⑪  $d^2 + 17d + 30(d+2)(d+15)$
- ⑫  $d^2 + 9d + 18(d+3)(d+6)$

- ⑬  $x^2 + 5xy + 4y^2(x+y)(x+4y)$
- ⑭  $x^2 - 18xy + 32y^2(x-2)(x-16y)$
- ⑮  $x^2 - 13xy + 40y^2(x-5y)(x-3y)$
- ⑯  $x^2 + 7xy + 12y^2(x+3y)(x-4y)$
- ⑰  $x^2 - 27xy + 26y^2(x-y)(x-26y)$
- ⑱  $x^2 + 19xy + 60y^2(x+4y)(x+15y)$

C	E	B	A	S	U	T	O	Y	F	N	U	L	E	O	M	A	T	O	R	E	G	A	N	L	T
$(m-2)(m-4)$	$(m+9)(m+1)$	$(m+8)(m+1)$	$(m-2)(m-6)$	$(m+7)(m+1)$	$(m+3)(m+4)$	$(m+2)(m+3)$	$(m+8)(m+3)$	$(m-2)(m-8)$	$(d+1)(d+13)$	$(d+2)(d+9)$	$(d+2)(d+15)$	$(d-5)(d-3)$	$(d-10)(d-2)$	$(d-2)(d-18)$	$(d-5)(d-4)$	$(d-4)(d-9)$	$(d+6)(d+3)$	$(x-16y)(x-2y)$	$(x+4y)(x+15y)$	$(x+y)(x+4y)$	$(x+4y)(x+3y)$	$(x+20y)(x+3y)$	$(x-5y)(x-8y)$	$(x-2y)(x-13y)$	$(x-x-26y)(x-y)$

# What Happened When the Boarding House Blew Up?

Factor each trinomial below. Find one of the factors in each column of binomials. Notice the letter next to one factor and the number next to the other. Write the letter in the box at the bottom of the page that contains the matching number.

①  $3x^2 + 7x + 2 = (x + 2)(3x + 1)$

②  $2x^2 + 5x + 3 = (2x + 3)(x + 1)$

③  $3x^2 - 16x + 5 = (3x - 1)(x - 5)$

④  $7x^2 - 9x + 2 = (7x - 2)(x - 1)$

⑤  $6u^2 + 5u + 1 = (2u + 1)(3u + 1)$

⑥  $8u^2 - 9u + 1 = (3u - 1)(u - 1)$

⑦  $10u^2 + 17u + 3 = (5u + 1)(2u + 3)$

⑧  $9u^2 - 9u + 2 = (3u - 1)(3u - 2)$

⑨  $5u^2 + 11u + 6 = (5u + 6)(u + 1)$

⑤  $(5u + 3)$       Y  $(3u - 2)$

③  $(x - 1)$       E  $(x - 5)$

⑧  $(3x + 1)$       G  $(8u - 1)$

⑭  $(3u - 1)$       O  $(7x - 2)$

⑥  $(2u + 3)$       R  $(5u + 1)$

⑮  $(x + 1)$       W  $(x + 2)$

⑨  $(5u + 6)$       L  $(7x + 2)$

⑦  $(2u + 1)$       I  $(2x + 3)$

⑪  $(3x - 1)$       E  $(u + 1)$

⑰  $(u - 1)$       S  $(3u + 1)$

⑩  $3n^2 + 2n - 1 = (3n - 1)(n + 1)$

⑪  $5n^2 - 4n - 1 = (5n + 1)(n - 1)$

⑫  $2n^2 + 5n - 3 = (2n - 1)(n + 3)$

⑬  $7n^2 - 13n - 2 = (7n + 1)(n - 2)$

⑭  $3t^2 + 14t - 5 = (3t - 1)(t + 5)$

⑮  $4t^2 - 11t + 7 = (t - 1)(4t - 7)$

⑯  $6t^2 + 5t - 1 = (6t - 1)(t + 1)$

⑰  $3t^2 - 20t - 7 = (3t + 1)(t - 7)$

⑫  $(3t - 1)$       N  $(n + 3)$

⑤  $(n - 1)$       R  $(t - 1)$

④  $(3t + 1)$       P  $(2t + 1)$

⑩  $(n - 2)$       O  $(n + 1)$

⑬  $(t + 1)$       F  $(t + 5)$

②  $(3n - 1)$       E  $(5n + 1)$

⑯  $(2n - 1)$       M  $(t - 7)$

④  $(3t - 7)$       R  $(7n + 1)$

①  $(4t - 7)$       L  $(6t - 1)$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
R	O	O	M	E	R	S	W	E	R	E	F	L	Y	I	N	G

OBJECTIVE 3-0: To factor trinomials of the form  $ax^2 + bx + c$ , where  $a$  is a positive integer greater than 1.

## "Boarding House"

$$\begin{aligned}
 1) \quad & 3x^2 + 7x + 2 \\
 & = 3x^2 + 6x + x + 2 \\
 & = 3x(x+2) + 1(x+2) \\
 & = (3x+1)(x+2)
 \end{aligned}$$

$$\begin{aligned}
 2) \quad & 2x^2 + 5x + 3 \\
 & = 2x^2 + 2x + 3x + 3 \\
 & = 2x(x+1) + 3(x+1) \\
 & = (2x+3)(x+1)
 \end{aligned}$$

$$\begin{aligned}
 3) \quad & 3x^2 - 16x + 5 \\
 & = 3x^2 - 15x - x + 5 \\
 & = 3x(x-5) - 1(x-5) \\
 & = (3x-1)(x-5)
 \end{aligned}$$

$$\begin{aligned}
 4) \quad & 7x^2 - 9x + 2 \\
 & = 7x^2 - 7x - 2x + 2 \\
 & = 7x(x-1) - 2(x-1) \\
 & = (7x-2)(x-1)
 \end{aligned}$$

$$\begin{aligned}
 5) \quad & 6u^2 + 5u + 1 \\
 & = 6u^2 + 2u + 3u + 1 \\
 & = 2u(3u+1) + 1(3u+1) \\
 & = (2u+1)(3u+1)
 \end{aligned}$$

$$\begin{aligned}
 6) \quad & 8u^2 - 9u + 1 \\
 & = 8u^2 - 8u - u + 1 \\
 & = 8u(u-1) - 1(u-1) \\
 & = (8u-1)(u-1)
 \end{aligned}$$

$$\begin{aligned}
 7) \quad & 10u^2 + 17u + 3 \\
 & = 10u^2 + 15u + 2u + 3 \\
 & = 5u(2u+3) + 1(2u+3) \\
 & = (5u+1)(2u+3)
 \end{aligned}$$

$$\begin{aligned}
 8) \quad & 9u^2 - 9u + 2 \\
 & = 9u^2 - 6u - 3u + 2 \\
 & = 3u(3u-2) - 1(3u-2) \\
 & = (3u-2)(3u-1)
 \end{aligned}$$

$$\begin{aligned}
 9) \quad & 5u^2 + 11u + 6 \\
 & = 5u^2 + 5u + 6u + 6 \\
 & = 5u(u+1) + 6(u+1) \\
 & = (5u+6)(u+1)
 \end{aligned}$$

$$10) \quad 3n^2 + 2n - 1 = (3n-1)(n+1)$$

$3n^2$	$3n$	$3n$
$-n$	$-1$	$-1$
$n$	$1$	

$$11) \quad 5n^2 - 4n - 1 = (5n+1)(n-1)$$

$5n^2$	$-5n$	$5n$
$n$	$-1$	$1$
$n$	$-1$	

$$12) \quad 2n^2 + 5n - 3 = (2n-1)(n+3)$$

$2n^2$	$6n$	$2n$
$-n$	$-3$	$-1$
$n$	$3$	

$$13) \quad 7n^2 - 13n - 2 = (7n+1)(n-2)$$

$7n^2$	$-14n$	$7n$
$n$	$-2$	$1$
$n$	$-2$	

$$14) \quad 3t^2 + 14t - 5 = (3t-1)(t+5)$$

$3t^2$	$15t$	$3t$
$-t$	$-5$	$-1$
$t$	$5$	

15)  $4t^2 - 11t + 7 = (t-1)(4t-7)$     16)  $6t^2 + 5t - 1 = (6t-1)(t+1)$

$4t^2$	$-4t$	$4t$
$-7t$	$7$	$7$

$t$      $1$

$6t^2$	$6t$	$6t$
$-t$	$-1$	$-1$

$t$      $1$

17)  $3t^2 - 20t - 7 = (3t+1)(t-7)$

$3t^2$	$-21t$	$3t$
$t$	$-7$	$1$

$t$      $-1$