

Notes: Factoring Trinomials, No GCMF

QUESTIONS

NOTES:

$a > 1$,
No GCMF

$$ax^2 + bx + c$$

ax^2	$__x$
$__x$	c

Steps to Factoring:

1. Multiply 'a' and 'c' terms
2. Use a M/S table to split 'b' term
M = factors that multiply to the '(a)(c)' term
S = sum of the factors that add to the 'b' term
3. Fill in box and work backwards using GCF to find factors

Examples:

$$4n^2 - 15n - 25$$

$$a = \underline{4} \quad b = \underline{-15} \quad c = \underline{-25} \quad (a)(c) = \underline{-100}$$

-100	-15
M	S

1. -100	$1 + -100 = -99$
2. -50	$2 + -50 = -48$
4. -25	$4 + -25 = -21$
5. -20	$5 + -20 = -15$

$4n$	5
n	n
$4n^2$	$5n$
-5	-5
$-20n$	-25

FACTORS: $\underline{(4n+5)(n-5)}$ ← GCF

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

$$a = \underline{5} \quad b = \underline{-18} \quad c = \underline{9} \quad (a)(c) = \underline{45}$$

45	-18
M	S

1. -45	$-1 + -45 = -46$
3. -15	$-3 + -15 = -18$

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

FACTORS: $\underline{(5x-3)(x-3)}$

a < 1,
No GCMF

Steps to Factoring:

1. Factor out a (-1)
2. Multiply 'a' and 'c' terms
4. Use a M/S table to split 'b' term
M = factors that multiply to the '(a)(c)' term
S = sum of the factors that add to the 'b' term
5. Fill in box and work backwards using GCF to find factors

$$\frac{-6a^2 - 25a - 25}{-1 \quad -1 \quad -1} \quad (-1)(6a^2 + 25a + 25)$$

a = 6 b = 25 c = 25 (a)(c) = 150

M	S
1 · 150	1 + 150 = 151
2 · 75	2 + 75 = 77
3 · 50	3 + 50 = 53
5 · 30	5 + 30 = 35
10 · 15	10 + 15 = 25

$2a$	$6a^2$	$10a$
5	$15a$	25

FACTORS: $-(3a+5)(2a+5)$ ← GCF ↑

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

a = 3 b = -4 c = 1 (a)(c) = 3

M	S
-1 · 3	-1 + -3 = -4

x	$3x^2$	$-x$
-1	$-3x$	1

FACTORS: $-(3x-1)(x-1)$ ← GCF ↑

7-6 Practice

Form G

Factoring $ax^2 + bx + c$

Factor each expression.

1. $2w^2 + 13w + 15$

$(2w+3)(w+5)$

	w	5
2w	$2w^2$	$10w$
3	$3w$	15

2. $3d^2 + 20d + 12$

$(3d+2)(d+6)$

	d	6
3d	$3d^2$	$18d$
2	$2d$	12

3. $14k^2 - 67k + 63$

$(2k+7)(7k+9)$

	7k	9
2k	$14k^2$	$18k$
7	$49k$	63

4. $3p^2 - 7p - 40$

$(3p+8)(p-5)$

	p	-5
3p	$3p^2$	$-15p$
8	$8p$	-40

5. $2m^2 - m - 15$

$(2m+5)(m-3)$

	m	-3
2m	$2m^2$	$-6m$
5	$5m$	-15

6. $5z^2 - 17z + 14$

$(5z-7)(z-2)$

	5z	-7
z	$5z^2$	$-7z$
-2	$-10z$	14

7. $-5a^2 + 22a - 8$

$-1(5a^2 - 22a + 8)$
 $-(5a-2)(a-4)$

	a	-4
5a	$5a^2$	$-20a$
-2	$-2a$	8

8. $-5t^2 + 24t + 5$

$-1(5t^2 - 24t - 5)$
 $-(5t+1)(t-5)$

	t	-5
5t	$5t^2$	$-25t$
1	t	-5

9. $-7c^2 + 2c + 9$

$-1(7c^2 - 2c - 9)$
 $-(7c-9)(c+1)$

	7c	-9
c	$7c^2$	$-9c$
1	$7c$	-9

10. $-8k^2 + 42k - 27$

$-1(8k^2 - 42k + 27)$
 $-(4k-3)(2k-9)$

	2k	-9
4k	$8k^2$	$-36k$
-3	$-6k$	27

11. $-3g^2 - 20g - 32$

$-1(3g^2 + 20g + 32)$
 $-(3g+8)(g+4)$

	g	4
3g	$3g^2$	$12g$
8	$8g$	32

12. $-2c^2 + 23c - 11$

$-1(2c^2 - 23c + 11)$
 $-(2c-1)(c-11)$

	c	-11
2c	$2c^2$	$-22c$
-1	$-c$	11