Practice
Factoring – Trinomials w/Non-1 Leading Coefficient

Answer these problems, then check your answers using the key on the next page. If you missed something, look at the solutions after the answer key, and if you still don't understand, watch the review video again.

#1) Factor this expression completely: $6x^2 - 24x + 24$

#2) Factor this expression completely: $25h^2 + 20h + 4$

#3) Factor this expression completely: $6k^2 - k - 1$

#4) Factor this expression completely: $2x^2 - 13x + 15$

#5) Factor this expression completely: $2x^2 + 13x + 15$

#6) Factor this expression completely: $2x^2 - 17x + 15$

#7) Factor this expression completely: $10x^2 - 13x - 3$

#8) Factor this expression completely: $2x^2 + 13xy + 15y^2$

#9) Factor this expression completely: $2x^2 - xy - 15y^2$

#10) Factor this expression completely: $36r^2 - 30r + 25$

Answers:

#1) $6(x-2)(x-2)$ *or* $6(x-2)^2$

#2) $(5h+2)(5h+2)$ *or* $(5h+2)^2$

#3) $(3k+1)(2k-1)$

#4) $(2x-3)(x-5)$

#5) $(2x+3)(x+5)$

#6) $(x-1)(2x-15)$

#7) $(5x+1)(2x-3)$

#8) $(2x+3y)(x+5y)$

#9) $(2x+5y)(x-3y)$

#10) No Solution

Solutions:

#1) Factor this expression completely: $6x^2 - 24x + 24$

GCF: $6(x^2 - 4x + 4)$

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

or

$6(x-2)^2$

M	A
4	−4
1 · 4	5
−1 · −4	−5
2 · 2	4
(−2)(−2)	−4 ←

check:

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

$6(x^2 - 2x - 2x + 4)$

$6(x^2 - 4x + 4)$

$6x^2 - 24x + 24$ ✓

#2) Factor this expression completely: $25h^2 + 20h + 4$

$(25h+10)(25h+10)$

5 5

$(5h+2)(5h+2)$

or

$(5h+2)^2$

M	A
100	20
1 · 100	
−1 · −100	
2 · 50	
−2 · −50	
4 · 25	
−4 · −25	
5 · 20	
−5 · −20	
(10)(10)	← 20
−10 · −10	

check:

$(5h+2)(5h+2)$

$25h^2 + 10h + 10h + 4$

$25h^2 + 20h + 4$ ✓

#3) Factor this expression completely: $6k^2 - k - 1$

$(6k+2)(6k-3)$

2 3

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

M	A
−6	−1
1 · −6	−5
−1 · 6	5
(2)(−3)	−1 ←
−2 · 3	1

check:

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

$6k^2 - 3k + 2k - 1$

$6k^2 - k - 1$ ✓

#4) Factor this expression completely: $2x^2 - 13x + 15$

$(2x-3)(2x-10)$

1 2

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

M	A
30	−13
1 · 30	
−1 · −30	
2 · 15	
−2 · −15	
3 · 10	
(−3)(−10)	← −3
5 · 6	
−5 · −6	

check:

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

$2x^2 - 10x - 3x + 15$

$2x^2 - 13x + 15$ ✓

#5) Factor this expression completely: $2x^2 + 13x + 15$

$(2x+3)(2x+10)$

1 2

$(2x+3)(x+5)$

M	A
30	13
1 · 30	
−1 · −30	
2 · 15	
−2 · −15	
(3)(10)	← 13
−3 · −10	
5 · 6	
−5 · −6	

check:

$(2x+3)(x+5)$

$2x^2 + 10x + 3x + 15$

$2x^2 + 13x + 15$ ✓

#6) Factor this expression completely: $2x^2 - 17x + 15$

$(2x-2)(2x-15)$
$2 \quad 1$

$\boxed{(x-1)(2x-15)}$

M	A
30	-17
1, 30	
-1, -30	
2, 15	
-2, -15	← -17
3, 10	
-3, -10	
5, 6	
-5, -6	

Check:
$(x-1)(2x-15)$
$2x^2 - 15x - 2x + 15$
$2x^2 - 17x + 15$ ✓

#7) Factor this expression completely: $10x^2 - 13x - 3$

$(10x+2)(10x-15)$
$2 \quad 5$

$\boxed{(5x+1)(2x-3)}$

M	A
-30	-13
1, -30	
-1, 30	
2, -15	← -13
-2, 15	
3, -10	
-3, 10	
5, -6	
-5, 6	

Check:
$(5x+1)(2x-3)$
$10x^2 - 15x + 2x - 3$
$10x^2 - 13x - 3$ ✓

#8) Factor this expression completely: $2x^2 + 13xy + 15y^2$

ignore y: $2x^2 + 13x + 15$

$(2x+3)(2x+10)$
$1 \quad 2$

reinsert y: $(2x+3)(x+5)$

$\boxed{(2x+3y)(x+5y)}$

M	A
30	13
1, 30	
-1, -30	
2, 15	
-2, -15	
3, 10	← 13
-3, -10	
5, 6	
-5, -6	

Check:
$(2x+3y)(x+5y)$
$2x^2 + 10xy + 3xy + 15y^2$
$2x^2 + 13xy + 15y^2$ ✓

#9) Factor this expression completely: $2x^2 - xy - 15y^2$

ignore y: $2x^2 - x - 15$

$(2x+5)(2x-6)$
$1 \quad 2$

reinsert y: $(2x+5)(x-3)$

$\boxed{(2x+5y)(x-3y)}$

M	A
-30	-1
1, -30	
-1, 30	
2, -15	
-2, 15	
3, -10	
-3, 10	
5, -6	← -1
-5, 6	

Check:
$(2x+5y)(x-3y)$
$2x^2 - 6xy + 5xy - 15y^2$
$2x^2 - xy - 15y^2$ ✓

#10) Factor this expression completely: $36r^2 - 30r + 25$

This trinomial doesn't factor (there is no combination of integers that multiply to 900 and add to -30) →

Point is: NOT ALL TRINOMIALS CAN BE FACTORED

M	A
900	-30
1, 900	901
-1, -900	-901
2, 450	452
-2, -450	-452
3, 300	303
-3, -300	-303
4, 225	229
-4, -225	-229
5, 180	185
-5, -180	-185

M	A
900	-30
6, 150	156
-6, -150	-156
9, 100	109
-9, -100	-109
10, 90	100
-10, -90	-100
12, 75	87
-12, -75	-87
15, 60	75
-15, -60	-75

M	A
900	-30
18, 50	68
-18, -50	-68
20, 45	65
-20, -45	-65
25, 36	61
-25, -36	-61
30, 30	60
-30, -30	-60