Factoring Trinomials

ax^2+bx+c

① n^2-n-90

b	ac
-1	-90
+9	-10

$a=1$
$b=-1$
$c=-90$

$(n+\frac{9}{1})(n-\frac{10}{1})$

$(n+9)(n-10)$

② $n^2-11n+18$

b	ac
-11	18
-9	-2

$a=1$
$b=-11$
$c=18$

$(n-\frac{9}{1})(n-\frac{2}{1})$

$(n-9)(n-2)$

③ $3n^2+27n+60$

$3(n^2+9n+20)$

b	ac
9	20
+4	+5

$a=1$
$b=9$
$c=20$

$(n+\frac{4}{1})(n+\frac{5}{1})$

$3(n+4)(n+5)$

④ $4n^2+32n+48$

$4(n^2+8n+12)$

b	ac
8	12
6	2

$a=1$
$b=8$
$c=12$

$(n+\frac{6}{1})(n+\frac{2}{1})$

$4(n+6)(n+2)$

⑤ $2r^2+15r-8$

b	ac
15	-16
+16	-1

$a=2$
$b=15$
$c=-8$

$(r+\frac{16}{2})(r-\frac{1}{2})$

$(r+8)(2r-1)$

⑥ $7x^2 - 5x - 2$

$a = 7$

$b = -5$

$c = -2$

b	ac
-5	-14
+2	-7

$(x + \frac{2}{7})(x - \frac{7}{7})$

$(7x + 2)(x - 1)$

⑦ $6b^2 - 26b - 60$

$2(3b^2 - 13b - 30)$

$a = 3$

$b = -13$

$c = -30$

b	ac
-13	-90
+5	-18

$(b - \frac{18}{3})(b + \frac{5}{3})$

$2(b - 6)(3b + 5)$

⑧ $6k^2 - 2k - 20$

$2(3k^2 - 1k - 10)$

$a = 3$

$b = -1$

$c = -10$

b	ac
-1	-30
+5	-6

$(k + \frac{5}{3})(k - \frac{6}{3})$

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

⑨ $4b^2 - 37b + 40$

$a = 4$

$b = -37$

$c = 40$

b	ac
-37	160
-32	-5

$y = 160/x$

table

$(b - \frac{32}{4})(b - \frac{5}{4})$

$(b - 8)(4b - 5)$

$10x^2 - 37x + 30$

$a = 10$

$b = -37$

$c = 30$

b	ac
-37	300
	-12 -25

$(x - \frac{12}{10})(x - \frac{25}{10})$

$(x - \frac{6}{5})(x - \frac{5}{2})$

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

Grouping

- 4 or more Terms

① $(6b^3 - 5b^2)(42b + 35)$ - Group Them

$b^2(6b-5) - 7(6b-5)$ - GCF

- Two ( ) should be the same

$\boxed{(6b-5)(b^2-7)}$

② $(3x^3 - 5x^2)(+24x - 40)$

$x^2(3x-5) + 8(3x-5)$

$\boxed{(3x-5)(x^2+8)}$

③ $32a^3 - 40a^2 - 12a + 15$

$8a^2(4a-5) - 3(4a-5)$

$\boxed{(4a-5)(8a^2-3)}$

Difference of Squares

$a^2 - b^2 = (a+b)(a-b)$

① Must be a binomial (2 terms)

② Must have a negative sign

③ Factor out any GCF

④ Must be able to Take Square Root

① $9k^2 - 25$ $\sqrt{9k^2} = 3k$ $\sqrt{25} = 5$

$(3k+5)(3k-5)$

② $4r^2 - 9$ $\sqrt{4r^2} = 2r$ $\sqrt{9} = 3$

$(2r+3)(2r-3)$

③ $x^2 - 4$ $\sqrt{x^2} = x$ $\sqrt{4} = 2$

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

④ $45x^2 - 80$ $\sqrt{9x^2} = 3x$ $\sqrt{16} = 4$

$5(9x^2 - 16)$

$5(3x+4)(3x-4)$

⑤ $3v^2 - 12$

$3(v^2 - 4)$ $\sqrt{v^2} = v$ $\sqrt{4} = 2$

$3(v+2)(v-2)$

⑥ $50n^2 - 18$ $\sqrt{25n^2} = 5n$ $\sqrt{9} = 3$

$2(25n^2 - 9)$

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

Algebra 1

Name_____ ID: 1

More Trinomials

Date_____ Period____

Factor each completely.

1) $n^2 + 10n + 24$

2) $r^2 + 5r + 4$

3) $x^2 - 4x - 60$

4) $2v^2 + 2v - 40$

5) $4a^2 - 4a - 224$

6) $4x^2 - 28x - 120$

7) $3a^2 + 31a + 70$

8) $2n^2 - n - 3$

9) $3m^2 + 7m - 10$

10) $12x^2 + 16x - 16$

11) $28b^2 + 244b - 360$

12) $20b^2 + 104b - 252$

13) $10v^2 - 7v - 6$

14) $9m^2 + 86m - 40$

15) $27v^2 + 138v + 120$

16) $20n^2 - 20n - 15$

Algebra 1 Name_____ ID: 1

Grouping

Date_____ Period____

Factor each completely.

1) $9k^3 + 24k^2 + 21k + 56$

2) $9x^3 + 6x^2 - 3x - 2$

3) $15r^3 + 9r^2 + 5r + 3$

4) $12x^3 - 28x^2 + 9x - 21$

5) $3v^3 - 6v^2 - 2v + 4$

6) $24n^3 - 18n^2 + 20n - 15$

7) $20x^3 + 35x^2 + 28x + 49$

8) $48n^3 - 18n^2 - 40n + 15$

9) $24p^3 + 21p^2 + 64p + 56$

10) $8k^3 + 32k^2 - 7k - 28$

Algebra 1 Name_____ ID: 1

Difference of Squares

Date_____ Period____

Factor each completely.

1) $9a^2 - 1$

2) $4k^2 - 1$

3) $x^2 - 16$

4) $x^2 - 9$

5) $4x^2 - 25$

6) $9p^2 - 25$

7) $32x^2 - 2$

8) $80k^2 - 5$

9) $36v^2 - 16$

10) $45b^2 - 80$

11) $2v^2 - 32$

12) $75x^2 - 3$