

T-chart method $x^2 + bx + c$

Section 10.5: Factoring $x^2 + bx + c$

1. Factor:

a. $x^2 + 5x + 6$

6	5
1 6	1 + 6 = 7
2 3	2 + 3 = 5

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

b. $x^2 - 5x + 6$

6	-5
1 6	
-2 3	-2 + 3 = 1

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

c. $x^2 + 6x + 8$

8	6
1 8	
2 4	2 + 4 = 6

$(x+2)(x+4)$

d. $x^2 - 2x - 8$

-8	-2
1 8	
2 4	2 - 4 = -2

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

e. $x^2 - x - 20$

-20	-1
1 20	
2 10	2 - 10 = -8
4 5	4 - 5 = -1

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

f. $x^2 + 7x + 12$

12	7
1 12	
2 6	2 + 6 = 8
3 4	3 + 4 = 7

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

g. $x^2 - 6x + 5$

5	-6
1 5	
-1 -5	-1 - 5 = -6

$(x-1)(x-5)$

h. $x^2 - 10x + 24$

24	-10
1 24	
-2 -12	-2 - 12 = -14
3 -8	3 - 8 = -5
4 -6	4 - 6 = -2
6 -4	6 - 4 = 2

$(x-4)(x-6)$

2. Solve.

Steps: 1. Put in standard form ($= 0$)

2. Factor

3. Use zero-product property to solve

a. $x^2 + 8x + 7 = 0$

7	8
1 7	
1 7	1 + 7 = 8

$0 = (x+7)(x+1)$

$x+7=0 \quad x+1=0$

$-7 -7 \quad -1 -1$

$x = -7 \quad x = -1$

b. $x^2 - 16x - 36 = 0$

-36	-16
1 36	
2 18	2 - 18 = -16
3 12	3 - 12 = -9
4 9	4 - 9 = -5
6 6	6 - 6 = 0

$0 = (x+2)(x-18)$

$x+2=0 \quad x-18=0$

$-2 -2 \quad +18 +18$

$x = -2 \quad x = 18$

c. $x^2 + 5x - 14 = 0$

-14	-14
1 14	
2 7	2 - 7 = -5

$x^2 + 5x - 14 = 0$

d. $x^2 + 27 = -12x$

$+12x + 12x$

$x^2 + 12x + 27 = 0$

$(x-2)(x+7) = 0$

$x-2=0 \quad x+7=0$

$x = 2 \quad x = -7$

$(x+3)(x+9) = 0$

$x+3=0 \quad x+9=0$

$x = -3 \quad x = -9$