Section 10.6: Factoring $ax^2 + bx + c$

Brit. method (parts)

1. Factor:

a. $2x^2 + 11x + 15$

ac | b

30 | 11

5+6

$(2x^2+5x)+(6x+15)$

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

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

b. $10x^2 + 17x + 3$

ac | b

30 | 17

1 30

2 15 → 2+15

3 10

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

$2x(5x+1)+3(5x+1)$

$(5x+1)(2x+3)$

c. $6x^2 - 10x - 4$

ac | b

−24 | −10

−12 2 → −12+2

$(6x^2+2x)+(-12x-4)$

$2x(3x+1)-4(3x+1)$

$(3x+1)(2x-4)$

$2(3x+1)(x-2)$ GCF

d. $8x^2 + 10x + 3$

ac | b

24 | 10

1 24

2 12

3 8

6 4 → 6+4

$(8x^2+6x)+(4x+3)$

$2x(4x+3)+1(4x+3)$

$(4x+3)(2x+1)$

e. $4x^2 - 3x + 8$

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

$9 - 128 = D = -119$

Not factorable

f. $5x^2 + 10x - 7$

ac | b

−21 | 10

1 21

3 7

$(10)^2 - 4(5)(-7)$

$100 + 84 = 184 = D$

Not factorable

Quad $x = \dfrac{-b \pm \sqrt{b^2-4ac}}{2a}$

2. Solve.

Steps: 1. Put in standard form (= 0)
2. Factor
3. Use zero-product property to solve

a. $3x^2 + 2x = 2$

$-2 \quad -2$

$3x^2 + 2x - 2 = 0$

$D = 2^2 - 4(3)(-2)$

$D = 4 + 24$ ***Not a perfect square

$D = 28$

***Must use the Quadratic Formula chapter 9.5

$\dfrac{-b \pm \sqrt{b^2-4ac}}{2a} = x$

$\dfrac{-2 \pm \sqrt{28}}{3} = x \quad x = \{.55, -1.22\}$

b. $4x^2 - 5 = 8x$

$-8x \quad -8x$

$4x^2 - 8x - 5 = 0$

ac | b

−20 | −8

−10 2 → −10+2

$(4x^2 - 10x)+(2x - 5)$

$2x(2x-5)+1(2x-5)=0$

$(2x+1)(2x-5)=0$