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CRMA 0372
College Readiness Algebra II
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① $21x^5y^2 + 35x^4y^3 - 14x^3y^5$
$= 7x^3y^2(3x^2 + 5xy - 2y^3)$

② $x^3 + 4x^2 - 6x - 24$
$= x^2(x+4) - 6(x+4)$
$= (x+4)(x^2-6)$

③ $x^2 - 11xy + 28y^2$
$= (x-7y)(x-4y)$

Mult $c=28$	Add $b=-11$
-1×-28	
⋮	
-4×-7	$-4+(-7)$

④ $2x^2 + 12x - 54$
$= 2(x^2 + 6x - 27)$
$= 2(x-3)(x+9)$

⑤ $8y^2 - 10y - 3$
$= (2y \quad 1)(4y \quad 3)$
$+4y$
$-6y$

$a=8$
1×8
2×4

$c=-3$
-1×3
1×-3

$= (2y-3)(4y+1)$
$+12y$
$+2y$

A 8	C -3	B -10
2	1	2
4	-3	-12

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

$6x^2 + 19x - 7$

6	-7	19
2	-1	-2
3	7	21

$4p^2 + 36p + 81$

$= (2p+9)(2p+9)$

$= (2p+9)^2$

4	81	36
2	9	18
2	9	18

(13) $25y^2 - 81$

$= (5y+9)(5y-9)$

(14) $4x^4 - 49y^2$

$= (2x^2 + 7y)(2x^2 - 7y)$

(15) $625x^3 + 135y^3$

$= 5(125x^3 + 27y^3)$

$= 5(5x+3y)(25x^2 - 15xy + 9y^2)$

Solving Quadratic Equation

① Factoring   Ex. $25x^2 = 81$

$25x^2 - 81 = 0$

$(5x-9)(5x+9) = 0$

$5x - 9 = 0$ or $5x + 9 = 0$

$x = 9/5$ $x = -9/5$

$\{-9/5, 9/5\}$

② Square root property - for any complex number k (real & imaginary)

$x^2 = k$

$x = \pm\sqrt{k}$

Solve by square root property.

$\frac{25x^2}{25} = \frac{81}{25}$

$x^2 = \frac{81}{25}$

$x = \pm\sqrt{\frac{81}{25}}$

$x = \pm\frac{9}{5}$

Solve $v^2 = -9$ where v is a real number.

$v = \pm 3i$ $i = \sqrt{-1}$

No real solution

③ Completing the square $(5x-9)(5x+9)=0$

④ Quadratic formula, $5x-9=0$ or $5x+9=0$

$x = 9/5$ $\quad$ $x = -9/5$

$\left\{-\frac{9}{5}, \frac{9}{5}\right\}$

Solve by root prop.

$(x+5)^2 = 36$

$\sqrt{(x+5)^2} = \pm\sqrt{36}$

$x+5 = \pm 6$

$x = -5 \pm 6$

$x = -5+6$ or $x=-5-6$

$x = 1$ or $x = -11$

To solve $ax^2+bx+c=0$ where, $a \neq 0$

by completing the square

① Make sure that $a=1$

$\frac{ax^2}{a} + \frac{bx}{a} + \frac{c}{a} = \frac{0}{a}$

$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$

(2) Arrange so that variable terms are on one side and constant terms on other.

$$x^2 + \frac{b}{a}x + \frac{b^2}{4a^2} = \frac{-4.c.a}{4a.a} + \frac{b^2}{4a^2}$$

(3) Factor $\sqrt{\left(x + \frac{b}{2a}\right)^2} = \pm\sqrt{\frac{-4ac + b^2}{4a^2}}$

(4) $x + \frac{b}{2a} = \pm \frac{\sqrt{b^2 - 4ac}}{2a}$

(5) $x = \frac{-b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$

(6) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Solve this by completing the square.

$x^2 - 6x + 13 = 0$

$x^2 - 6x + \boxed{9} = -13 + 9$

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

$x - 3 = \pm 2i$

$x = 3 \pm 2i$

use quad formula to solve

$6x^2 + 19x - 7 = 0$

$x = \frac{-19 \pm \sqrt{(19)^2 - 4.(6).(-7)}}{2(6)}$

$= \frac{-19 \pm \sqrt{361 + 168}}{12}$

$= \frac{-19 \pm \sqrt{529}}{12}$

$x = \frac{-19 \pm 23}{12}$

$x = \frac{-19 + 23}{12}$ or $x = \frac{-19 - 23}{12}$

$= \frac{4}{12} = \frac{1}{3}$ $\qquad = \frac{-42}{12} = -\frac{7}{2}$

$ax^2 + bx + c$

Quadratic Formula

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

Discriminant

$b^2 - 4ac$

- if this is greater than zero and a perfect square you have two rational solution
- if this is greater than zero and not a perfect square, there are two irrational solution.
- if this equal zero, you have one rational solution.
- if this is negative, there are two imaginary solution.