Algebra I

12-3

Quadratic Formula

Solving Quadratic Equations -

Types of Equations	Method for Solving.
$0 = ax^2$	divide by a, radical
$0 = ax^2 + c$	$-c, \div a, \sqrt{}$
$0 = (x - h)^2$	$\sqrt{}$, ± 1, $\pm$, $+h$
$0 = a(x - h)^2$	$\div a, \sqrt{}, \pm 1, \pm, +h$
$0 = a(x - h)^2 + k$	$-k, \div a, \sqrt{}, \pm 1, \pm, +h$
$0 = ax^2 + bx$	factor: $0 = x(ax+b)$; $x=0$ $ax+b=0$ $\{0, -\frac{b}{a}\}$
$0 = ax^2 + bx + c$	factor: Backwards FOIL

radical method.

what happens when the Factor method doesn't work?

The Quadratic Formula -

Given $ax^2 + bx + c = 0$,

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

Solve. Find a part b) to the nearest hundredth if necessary.

*1) $x^2 + 5x + 6 = 0$

$a=1$ $b=5$ $c=6$

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

$$x = \frac{-(5) \pm \sqrt{5^2-4(1)(6)}}{2(1)}$$

$$x = \frac{-5 \pm \sqrt{25-24}}{2} = \frac{-5 \pm \sqrt{1}}{2}$$

$$\frac{-5 \pm 1}{2} = \frac{-4}{2} \text{ or } \frac{-6}{2} \quad \{-2, -3\}$$

or $x^2 + 5x + 6 = 0$

$(x+3)(x+2) = 0$

$x+3=0$ $x+2=0$

$x=-3$ $x=-2$

$\{-3, -2\}$

*2) $5x^2 + 9x = 2$

$5x^2+9x-2 = 2-2$

$5x^2+9x-2 = 0$

$a=5$ $b=9$ $c=-2$

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

$$x = \frac{-(9) \pm \sqrt{9^2-4(5)(-2)}}{2(5)}$$

$$\frac{-9 \pm \sqrt{81+40}}{10} =$$

$$\frac{-9 \pm \sqrt{121}}{10} = \frac{-9 \pm 11}{10}$$

$$\frac{-9+11}{10} \text{ or } \frac{-9-11}{10}$$

$$\frac{2}{10}, \frac{-20}{10}$$

$\{\frac{1}{5}, -2\}$

*3) $-4x^2 + 2x + 3 = 0$

$a=-4$ $b=2$ $c=3$

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

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

$$x = \frac{-2 \pm \sqrt{4+48}}{-8}$$

$$x = \frac{-2 \pm \sqrt{52}}{-8}$$

$$x = \frac{-2 \pm \sqrt{4 \cdot 13}}{-8}$$

$$x = \frac{-2 \pm 2\sqrt{13}}{-8}$$

$$x = \frac{1 \pm \sqrt{13}}{4}$$

$\left\{\frac{1 \pm \sqrt{13}}{4}\right\}$

$\{1.15, -.65\}$

Assignment:
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2-18 even.

Do part b when necessary.