Name:_____ Date:_____

Class/Home worksheet: Alg2H
Quadratic equation: using factoring and completing the square.
(book chapter 8, page 342 to 345)

An equation of the type

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

where a,b, and c are constants, and $a \neq 0$, is called **standard form of the quadratic equation.**

Solve:

$3x^2 + 5x = 0$

$x(3x+5)=0$

$x=0$ or $x=-\frac{5}{3}$

Solve:

$2x^2 + 7x = 0$

$x(2x+7)=0$

$x=0$ or $x=-\frac{7}{2}$

Solve:

$5x^2 - 7 = 0$

$5x^2=7$

$x^2=\frac{7}{5} \Rightarrow x=\pm\sqrt{\frac{7}{5}}$

Solve:

$3x^2 - 6 = 0$

$3x^2=6$

$x^2=2 \Rightarrow x=+\sqrt{2}$ or $x=-\sqrt{2}$

Solve:

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

M	A	T
12	-7	-4, -3

$6x^2-3x-4x+2=0$

$3x(2x-1)-2(2x-1)=0$

$(3x-2)(2x-1)=0$

$x=\frac{2}{3}$ or $x=\frac{1}{2}$

Solve:

$14x^2 + 2 = 11x$

$14x^2+11x+2=0$

M	A	T
28	-11	-4, -7

$14x^2-7x-4x+2=0$

$7x(2x-1)-2(2x-1)=0$

$(7x-2)(2x-1)=0$

$x=\frac{2}{7}$ or $x=\frac{1}{2}$

Completing the Square (P. 343)

$$A^2 + 2AB + B^2 = (A + B)^2$$

Solve by completing the square:

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

$x^2 - 2x = 8$

$x^2 - 2x + 1 = 8 + 1$

$(x - 1)^2 = 9$

$x - 1 = 3$ or $x - 1 = -3$

$x = 4$ or $x = -2$

Solve by completing the square:

$$4x^2 + 12x - 7 = 0$$

$4x^2 + 12x = 7$

$x^2 + 3x = \frac{7}{4}$

$x^2 + 3x + \left(\frac{3}{2}\right)^2 = \frac{7}{4} + \left(\frac{3}{2}\right)^2$

$\left(x + \frac{3}{2}\right)^2 = \frac{7}{4} + \frac{9}{9}$

$\left(x + \frac{3}{2}\right)^2 = 4$

$x + \frac{3}{2} = 2$ or $x + \frac{3}{2} = -2$

$x = 0.5$ or $x = -3.5$

Solve by completing the square:

$$3x^2 + 18x + 24 = 0$$

$x^2 + 6x + 8 = 0$

$x^2 + 6x = -8$

$x^2 + 6x + 9 = -8 + 9$

$x^2 + 6x + 9 = 1$

$(x + 3)^2 = 1$

$x + 3 = 1$ or $x + 3 = -1$

$x = -2$ or $x = -4$

From the book, Page 345-6

(1) Solve: $7x^2 - 3x = 0$

$x(7x-3)=0$

$x=0$ or $x=\frac{3}{7}$

(6) Solve: $6x^2 - x - 2 = 0$

M	A	T
-12	-1	-4, 3

$6x^2+3x-4x-2=0$

$3x(2x+1)-2(2x+1)=0$

$(3x-2)(2x+1)=0$

$x=\frac{2}{3}$ or $x=-\frac{1}{2}$

(11) Solve: $3x^2 + 7x = 20$

$3x^2+7x-20=0$

M	A	T
-60	7	12, -5

$3x^2+12x-5x-20=0$

$3x(x+4)-5(x+4)=0$

$(3x-5)(x+4)=0$

$x=-4$ or $x=\frac{5}{3}$

(18) Solve: $4x^2 = 20$

$x^2=5$

$x=\sqrt{5}$ or $x=-\sqrt{5}$

(42) Solve by completing the square:

$x^2 - 4x + 1 = 0$

$x^2-4x=-1$

$x^2-4x+4=-1+4$

$(x-2)^2=+3$

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

$x-2=+\sqrt{3}$ or $x-2=-\sqrt{3}$

$x=2+\sqrt{3}$ or $x=2-\sqrt{3}$

(43) Solve by completing the square:

$y^2 + 6y - 3 = 0$

$y^2+6y=3$

$y^2+6y+9=3+9$

$(y+3)^2=12$

$y+3=\pm\sqrt{12}$

$y=-3+\sqrt{12}$ or $y=-3-\sqrt{12}$