*AAT

Name: Key

Chapter 2: 2-3 Quadratic Equations (IC/HW)-Day 2

Date: _____ Period: _____

Determine the values of *d* that complete the square for the expression.

1. (a) $x^2 + 9x + d$ $\left(\frac{9}{2}\right)^2 = \frac{81}{4}$

(b) $x^2 - 8x + d$ $\left(\frac{8}{2}\right)^2 = 4^2 = 16$

(c) $x^2 + dx + 36$ $\sqrt{36} = 6 \cdot 2 = \pm 12$

(d) $x^2 + dx + \frac{49}{4}$ $\sqrt{\frac{49}{4}} = \frac{7}{2} \cdot 2 = \pm 7$

2. (a) $x^2 + 13x + d$ $\left(\frac{13}{2}\right)^2 = \frac{169}{4}$

(b) $x^2 - 6x + d$ $\left(\frac{6}{2}\right)^2 = 3^2 = 9$

(c) $x^2 + dx + 25$ $\sqrt{25} = 5 \cdot 2 = \pm 10$

(d) $x^2 + dx + \frac{81}{4}$ $\sqrt{\frac{81}{4}} = \frac{9}{2} \cdot 2 = \pm 9$

Solve by completing the square.

3. $x^2 + 6x + 7 = 0$

$x^2 + 6x = -7$

$x^2 + 6x + 9 = -7 + 9$

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

$x + 3 = \pm\sqrt{2}$

$x = -3 \pm \sqrt{2}$

4. $x^2 - 8x + 11 = 0$

$x^2 - 8x = -11$

$x^2 - 8x + 16 = -11 + 16$

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

$x - 4 = \pm\sqrt{5}$

$x = 4 \pm \sqrt{5}$

5. $4x^2 - 12x - 11 = 0$

$\frac{4x^2}{4} - \frac{12x}{4} = \frac{11}{4}$

$x^2 - 3x + \frac{9}{4} = \frac{11}{4} + \frac{9}{4}$

$\sqrt{(x - \frac{3}{2})^2} = \sqrt{\frac{20}{4}}$

$x - \frac{3}{2} = \pm\sqrt{5}$

$x = \frac{3}{2} \pm \sqrt{5}$

6. $4x^2 + 20x + 13 = 0$

$\frac{4x^2}{4} + \frac{20x}{4} = -\frac{13}{4}$

$x^2 + 5x + \frac{25}{4} = -\frac{13}{4} + \frac{25}{4}$

$\sqrt{(x + \frac{5}{2})^2} = \sqrt{\frac{12}{4}}$; $x + \frac{5}{2} = \pm\sqrt{3}$; $x = -\frac{5}{2} \pm \sqrt{3}$

Solve by using the quadratic formula.

7. $6x^2 - x = 2$

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

$\frac{1 \pm \sqrt{1 - 4(6)(-2)}}{2(6)}$

$= \frac{1 \pm \sqrt{49}}{12} = \frac{1 \pm 7}{12}$

$x = \frac{8}{12} = \frac{2}{3}$; $x = \frac{-6}{12} = -\frac{1}{2}$

8. $x^2 + 4x + 2 = 0$

$\frac{-4 \pm \sqrt{16 - 4(1)(2)}}{2(1)}$

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

$x = -2 \pm \sqrt{2}$

9. $2x^2 - 3x - 4 = 0$

$\frac{3 \pm \sqrt{9 - 4(2)(-4)}}{2(2)}$

$\frac{3 \pm \sqrt{41}}{4}$

$x = \frac{3 \pm \sqrt{41}}{4}$

Solve for the specified variable.

10. $K = \frac{1}{2}mv^2$ for v. (Kinetic energy)

$\frac{2K}{m} = \frac{mv^2}{m}$

$\sqrt{\frac{2K}{m}} = \sqrt{v^2}$

$\sqrt{\frac{2K}{m}} = v$

11. $F = g\frac{mM}{d^2}$ for d. (Newton's law of gravitation)

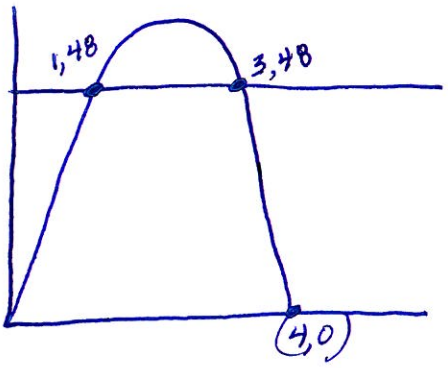
$d^2 = \frac{gmM}{F}$

$d = \sqrt{\frac{gmM}{F}}$

12. A baseball is thrown straight upward with an initial speed of 64 ft/sec. The number of feet s above the ground after t seconds is given by the equation $s = -16t^2 + 64t$.

(a) When will the baseball be 48 feet above the ground?

after 1 sec & after 3 sec.



(b) When will the baseball hit the ground?

after 4 sec.