

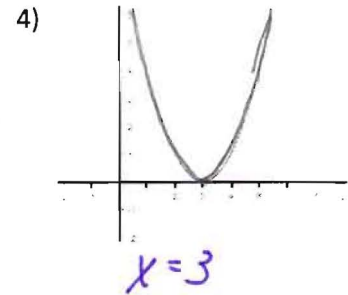
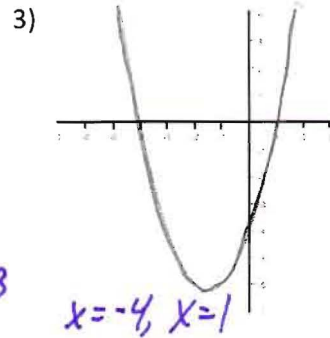
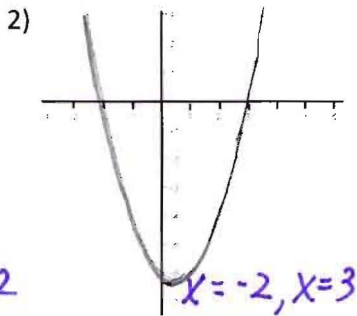
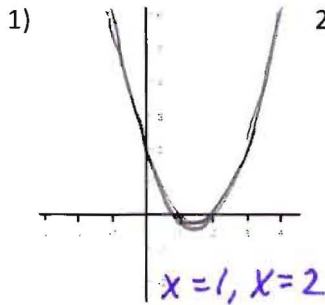
Name Key

Date _____

Solving Quadratic Equations

Use the given graph to determine the solutions of each quadratic equation.

(Write solutions as $x = \underline{\hspace{2cm}}$)



Use "FOIL" and the results from problems 1 through 4 to find each quadratic equation.

5) Results from problem 1
 $x = 1$ or $x = 2$
 $-1 \quad -1 \quad -2 \quad -2$
 $x - 1 = 0$ or $x - 2 = 0$
 $(x - 1)(x - 2) = 0$
 F O I L
 $x^2 \quad -2x \quad -x \quad +2$
 $x^2 - 3x + 2 = 0$

6) Results from problem 2
 $x = -2$ or $x = 3$
 $+2 \quad +2 \quad -3 \quad -3$
 $x + 2 = 0$ or $x - 3 = 0$
 $(x + 2)(x - 3) = 0$
 F O I L
 $x^2 \quad -3x \quad +2x \quad -6$
 $x^2 - x - 6 = 0$

7) Results from problem 3
 $x = -4$ or $x = 1$
 $+4 \quad +4 \quad -1 \quad -1$
 $x + 4 = 0$ or $x - 1 = 0$
 $(x + 4)(x - 1) = 0$
 F O I L
 $x^2 \quad -x \quad +4x \quad -4$
 $x^2 + 3x - 4 = 0$

8) Results from problem 4
 (Hint: What do you do when there is only one solution)
 $x = 3$
 $-3 \quad -3$
 $x - 3 = 0$
 $(x - 3)^2 = 0$
 $(x - 3)(x - 3) = 0$
 F O I L
 $x^2 \quad -3x \quad -3x \quad +9$
 $x^2 - 6x + 9 = 0$

Use Factoring to find the solutions to each quadratic equation

9) $x^2 + 7x + 12 = 0$
 $(x + 4)(x + 3) = 0$
 $x + 4 = 0$ or $x + 3 = 0$
 $-4 \quad -4 \quad -3 \quad -3$
 $x = -4$ or $x = -3$

10) $x^2 - 7x + 10 = 0$
 $(x - 2)(x - 5) = 0$
 $x - 2 = 0$ or $x - 5 = 0$
 $+2 \quad +2 \quad +5 \quad +5$
 $x = 2$ or $x = 5$

11) $2x^2 - x - 3 = 0$
 $(2x - 3)(x + 1) = 0$
 $2x - 3 = 0$ or $x + 1 = 0$
 $+3 \quad +3 \quad -1 \quad -1$
 $\frac{2x}{2} = \frac{3}{2}$ or $x = -1$
 $x = \frac{3}{2}$ or $x = -1$

12) $6x^2 + x - 2 = 0$
 $(3x + 2)(2x - 1) = 0$
 $3x + 2 = 0$ or $2x - 1 = 0$
 $-2 \quad -2 \quad +1 \quad +1$
 $\frac{3x}{3} = -\frac{2}{3}$ or $\frac{2x}{2} = \frac{1}{2}$
 $x = -\frac{2}{3}$ or $x = \frac{1}{2}$

Solve each quadratic equation by "Completing the Square"

13) $x^2 - 6x - 7 = 0$

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

$$\sqrt{(x-3)^2} = \pm\sqrt{16}$$

$$x-3 = \pm 4$$

$$x = 3 \pm 4$$

$x = 3+4$ or $x = 3-4$
 $x = 7$ or $x = -1$

14) $x^2 + 8x + 3 = 0$

$$x^2 + 8x + 16 = -3 + 16$$

$$\sqrt{(x+4)^2} = \pm\sqrt{13}$$

$$x+4 = \pm\sqrt{13}$$

$$x = -4 \pm \sqrt{13}$$

15) $x^2 + 4x + 12 = 0$

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

$$\sqrt{(x+2)^2} = \sqrt{-8}$$

NO Solution

we can't take the $\sqrt{}$ of a negative number

16) $x^2 + 3x - 6 = 0$

$$x^2 + 3x + \frac{9}{4} = 6 + \frac{9}{4}$$

$$\sqrt{(x+\frac{3}{2})^2} = \pm\sqrt{\frac{33}{4}}$$

$$x + \frac{3}{2} = \pm\sqrt{\frac{33}{4}}$$

$$x = \frac{-3 \pm \sqrt{33}}{2}$$

Use the "Discriminant" to find the number of solutions for each quadratic equation:

17) $x^2 + 3x + 5 = 0$

$$3^2 - 4(1)(5)$$

$$9 - 20 = -11$$

NO Solution

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

$$7^2 - 4(1)(-6)$$

$$49 + 24 = 73$$

2 solutions

19) $x^2 + 16x + 64 = 0$

$$16^2 - 4(1)(64)$$

$$256 - 256 = 0$$

1 Solution

20) $x^2 - 4x - 3 = 0$

$$(-4)^2 - 4(1)(-3)$$

$$16 + 12 = 28$$

2 solutions

21) $2x^2 - 3x + 5 = 0$

$$(-3)^2 - 4(2)(5)$$

$$9 - 40 = -31$$

NO Solution

22) $3x^2 - 2x - 4 = 0$

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

$$4 + 48 = 52$$

2 solutions

Use the "Quadratic Formula" to find the solutions for the following quadratic equations: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

23) $x^2 + 4x - 7 = 0$

$$\frac{-4 \pm \sqrt{(4)^2 - 4(1)(-7)}}{2(1)}$$

$$\frac{-4 \pm \sqrt{16 + 28}}{2}$$

$$\frac{-4 \pm \sqrt{44}}{2}$$

$$\frac{-4 \pm \sqrt{4 \cdot 11}}{2}$$

$x = -2 \pm \sqrt{11}$

24) $2x^2 - 3x - 1 = 0$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-1)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9 + 8}}{4}$$

$x = \frac{3 \pm \sqrt{17}}{4}$

25) $3x^2 + 2x + 2 = 0$

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

$$\frac{-2 \pm \sqrt{4 - 24}}{6}$$

$$\frac{-2 \pm \sqrt{-20}}{6}$$

NO Solution