

SUMMARY IN SOLVING QUADRATICS

Method	"The Cheer"	Factoring	Completing the Square	Quadratic Formula
Explanation/Definition	1 Square root Square root plus, minus! "	When it can be written in the form $(x-a)(x-b)=0$ Then $x=a, b$	Changing the equation so that "The Cheer" can be used. Form: $a(x-h)^2+k=0$	When $ax^2+bx+c=0$ $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
When should we use this method?	When there is an "x ² " term and no "x" term or $(x-a)^2=?$	When it is a quick factoring problem	(Ideally) - For $ax^2+bx+c=0$ when $a=1$ and b =even#, but it works in all cases.	When the other methods are "ugly".
Can it work for everything? Why/why not?	No, most equations are in the form of $ax^2+bx+c=0$	No, some quadratics cannot be factored.	Yes!	Yes! Works for everything!
Example	<p>Remember: $\sqrt{ab} = \sqrt{a} \times \sqrt{b}$ $\therefore \sqrt{50} = \sqrt{25} \times \sqrt{2} = 5\sqrt{2}$ "</p> <p>Ex: $x^2=25$ $\sqrt{x^2} = \sqrt{25}$ "square root" $x = \pm 5$ "plus minus"</p> <hr/> <p>Ex: $(x-2)^2=50$ $\sqrt{(x-2)^2} = \sqrt{50}$ $(x-2) = \pm \sqrt{50}$ $x = 2 \pm \sqrt{50}$ $= 2 \pm 5\sqrt{2}$</p>	<p>Ex: $x^2+6x+8=0$ $(x+4)(x+2)=0$ $x = -4, -2$</p> <hr/> <p>$6x^2+5x-4=0$ $\frac{2}{3}x^{-1} \times \frac{3}{4}$ $(2x-1)(3x+4)=0$ $x = \frac{1}{2}, -\frac{4}{3}$</p>	<p>Ex: $x^2+4x = 1$ → $(x^2+4x+4-4) = 1$ $(x^2+4x+4) = 1+4$ $(x+2)^2 = 5$ $x+2 = \pm \sqrt{5}$ $x = 2 \pm \sqrt{5}$</p> <hr/> <p>$(3x^2+15x)-2=0$ $3(x^2+5x+\frac{25}{4}-\frac{25}{4})-2=0$ $3(x^2+5x+\frac{25}{4})-2-\frac{75}{4}=0$</p>	<p>Ex: $3x^2+5x-7=0$ $x = \frac{-5 \pm \sqrt{25-4(3)(-7)}}{2(3)}$ $= \frac{-5 \pm \sqrt{109}}{6}$ "</p>

$3(x+\frac{5}{2})^2 = \frac{83}{4}$
 $(x+\frac{5}{2})^2 = \frac{83}{12}$ $\therefore x = -\frac{5}{2} \pm \sqrt{\frac{83}{12}}$ "

Name _____

Date _____ Period _____

Solving Quadratic Equations

Solve each equation

1) $p^2 + 14p - 38 = 0$

$$p = -7 \pm \sqrt{87}$$

2) $v^2 + 6v - 59 = 0$

$$v = -3 \pm 2\sqrt{17}$$

3) $a^2 + 14a - 51 = 0$

$$a = 3, -17$$

4) $x^2 - 12x + 11 = 0$

$$x = 11, 1$$

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

$$x = -2, -4$$

6) $n^2 - 2n - 3 = 0$

$$n = 3, -1$$

7) $x^2 + 14x - 15 = 0$

$$x = 1, -15$$

8) $k^2 - 12k + 23 = 0$

$$k = 6 \pm \sqrt{13}$$

9) $r^2 - 4r - 91 = 7$

$$r = 2 \pm \sqrt{102}$$

10) $x^2 - 10x + 26 = 8$

$$x = 5 \pm \sqrt{7}$$

11) $k^2 - 4k + 1 = -5$

no real
solution.

12) $b^2 + 2b = -20$

no real
solution.

$$13) v^2 - 6v = -91$$

no real
solution.

$$14) n^2 = 18n + 40$$

$$n = 20, -2.$$

$$15) 5k^2 = 60 - 20k$$

$$k = 2, -6$$

$$16) 6x^2 - 48 = -12x$$

$$x = 2, -4$$

$$17) 8x^2 + 16x = 42$$

$$x = \frac{3}{2}, -\frac{7}{2}$$

$$18) 9n^2 + 79 = -18n$$

no real
solution.

$$19) 2a^2 = -6 + 8a$$

$$a = 3, 1$$

$$20) 2x^2 - 5x + 67 = 0$$

no real
solution.

$$21) 4n^2 + 4n + 36 = 0$$

no real
solution.

$$22) 7k^2 - 16k + 100 = 0$$

no real
solution.

$$23) 10p^2 + 4p + 77 = 9$$

no real
solution.

$$24) 3x^2 = -4 + 8x$$

$$x = 2, \frac{2}{3}$$