Chapter 6

Factoring ax^2+bx+c if 'a' is not 1 and can't be factored out

1. Check for a common factor
2. Multiply '*a*' by '*c*'
3. Find two integers who have a
4. product of this number (*a* x *c*)and a sum of '*b*'
5. Break up the middle term into the integers that satisfy the product and sum
6. Factor by grouping

Factoring ax^2+bx+c if 'a' is 1 or can be factored out

1. Check for a common factor
2. Find two integers who have a product of 'c' and a sum of 'b'
3. Put those integers into (x+*r*)(x+*s*) for '*r*' and '*s*'

Completing the Square:

Going from standard form to vertex form

$y=ax^2+bx+c$ to $y=a(x-h)^2+k$

1) Put brackets around the first two terms
2) Factor out the number in front of the x^2 (not the letter)
3) Look at the last term in the brackets, divide it by 2 and then square it.
4) Add and subtract that term behind the last term in the brackets.
5) Move the negative term outside of the brackets by first multiplying it by the 'a' value.
6) Simplify the terms outside of the brackets.
7) Factor the perfect square trinomial $(x + b/2)^2$

Perfect Square Trinomial:
$a^2+2ab+b^2 = (a+b)^2$
$a^2-2ab+b^2= (a-b)^2$

Remember: the 'c' value of a perfect square trinomial is half of the 'b' value squared : $(b/2)^2$

Quadratic Formula

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

Axis of symmtery: -b/2a

Use the discriminate to determine the number of roots:

If $b^2-4ac < 0$ → 0 roots
If $b^2-4ac = 0$ → 1 root
If $b^2-4ac > 0$ → 2 roots

Solving by Factoring:

1) It must be set to equal 0. Before factoring, it must be in the form $ax^2+bx+c=0$
2) Factor the left side of the equation
3) Set each factor to equal zero and solve for 'x'.

zero product rule: if two factors have a product of zero; one or both of the factors must equal zero.

Remember: the axis of symmetry is the x-coordinate of the vertex. Find the axis of symmetry by adding the x-intercepts and then dividing by 2. Use the axis of symmetry to find the y-coordinate of the vertex