

## Algebra 12-5 Factoring $ax^2 + bx + c$

**In 1-4, factor into the product of two binomials.**

1.  $2n^2 + 13n + 15 =$  \_\_\_\_\_

2.  $4n^2 + 16n + 7 =$  \_\_\_\_\_

3.  $3n^2 + 14n - 5 =$  \_\_\_\_\_

4.  $4n^2 - 11n + 6 =$  \_\_\_\_\_

5. Solve  $6n^2 + 7n - 3 = 0$

6. Solve  $4n^3 - 36n = 0$

Try this trick to help you solve complex equations like #5 above. Take the  $a$  and  $c$  values and multiply them together and put them in  $c$ 's spot.

Now the equation will be  $x^2 + bx + ac = 0$ . In the equation  $3x^2 + 16x + 5 = 0$ , you would multiply the  $a$  value of 3 and the  $c$  value of 5 to get 15. Your new equation would be  $x^2 + 16x + 15 = 0$ . Now solve the equation like you normally would. In this case  $x^2 + 16x + 15 = 0$  factors into  $(x + 15)(x + 1) = 0$ . Hence,  $x = -15$  or  $x = -1$ . Now you must divide both answers by your original  $a$  value of 3. Thus, the final answers would be  $x = -15/3 = -5$  or  $x = -1/3$ .

**Look at the example below.**

Example:  $4n^2 + 7n + 3 = 0$       Take the  $a$  value of 4 and multiply it by  $c$ 's value of 3 to get 12.

$$n^2 + 7n + 12 = 0$$

$$(n + 4)(n + 3) = 0$$

$n = -4$  or  $n = -3$       Now you must divide by the original  $a$  value of 4.

Real Answer  $n = -4/4 = -1$  or  $n = -3/4$