**Solving Quadratic Equations by Factoring**

1. Let’s solve the equation $x^{2}-7x+12=0$ by factoring. To do this, fill in the blanks for each step below.

**Step 1:** Find all factor pairs for 12: $12×1$, $6× \\_\\_\\_$ ,

**Step 2:** Factor the left side of the equation: (*x – \_\_\_*)(*x \_\_\_* 3) = 0

**Step 3:** Using the Zero Product Property, either *x* – 4 = 0 or \_\_\_\_\_\_\_ = 0

**Step 4:** If *x –* 4 = 0 then If  *\_\_\_\_\_\_\_ =* 0 then

 *x = \_\_\_\_\_ x = \_\_\_\_\_*

1. Now that you have experienced this process, solve each of the equations below by factoring the left side and using the Zero Product Property.
2. $x^{2}+8x+7=0$
3. $x^{2}-8x+7=0$
4. $x^{2}+6x-7=0$
5. $x^{2}-6x-7=0$
6. Describe any patterns you observe in solving equations 2(a) through 2(d).
7. Check 2(a) through 2(d) by graphing functions on a calculator.
8. Could you solve $x^{2}+6x+7=0$ by factoring? Why or why not?
9. Solve each of these equations by factoring the left side and using the Zero Product Property.
10. $x^{2}+16x+15=0$
11. $x^{2}-8x+15=0$
12. $x^{2}+2x-15=0$
13. $x^{2}-14x-15=0$
14. Find another quadratic equation of the form $x^{2}+bx+15=0$ or $x^{2}+bx-15=0$ that you can solve by factoring and solve it.
15. Find a quadratic equation of the form $x^{2}+bx+15=0$ or $x^{2}+bx-15=0$ that you cannot solve by factoring and explain why you can’t solve it.
16. Solve each of these equations by factoring.
17. $2x^{2}+7x+5=0$
18. $2x^{2}+11x+5=0$
19. $2x^{2}-3x-5=0$
20. $2x^{2}+9x-5=0$
21. Find another quadratic equation with the same leading coefficient (that is, *a* = 2) that can be solved by factoring, and solve it.
22. Solve each of these equations by factoring.
23. $x^{2}-11x+24=0$
24. $5x^{2}+4x-1=0$
25. $3x^{2}-30x-33=0$ (Hint: first find a common factor for all three terms)
26. $x^{2}-8x+16=0$
27. How is the solution for (d) different from the other solutions on this page?