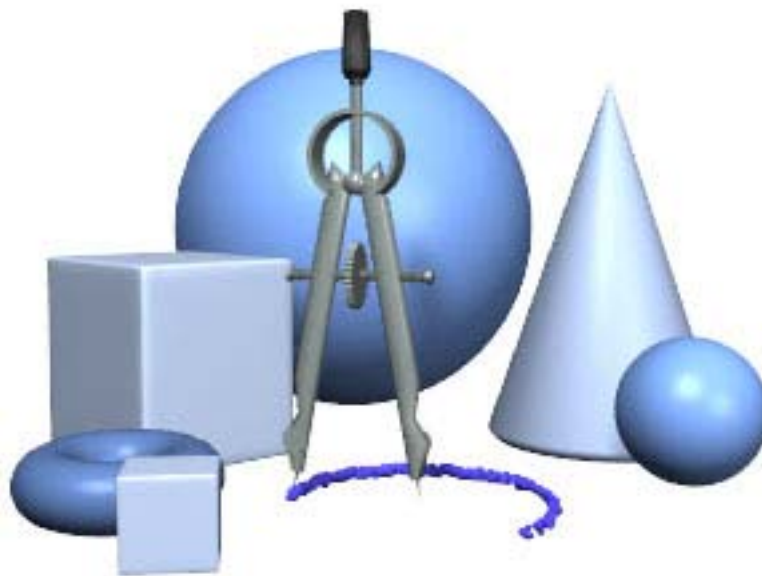# SIMPLY MATH^{Tm} WORKBOOK #12

Factoring Trinomials of the Form:

$Ax^2 + Bx + C$, when $A \neq 1$

The New AC-Method

Fort Bend Tutoring

The New AC-Method (Ax^2+Bx+C, when $A\neq1$)

Example 1

Factor Completely: $2y^2 - 3y - 14$

$$28$$

| $1\cdot28$ |
| $2\cdot14$ |
| $4\cdot7$ |

$$\boxed{-28}$$

$$2y^2 - 3y - 14$$

1. Multiply the 1st and 3rd coefficients to get *-28*. Then find factors of *-28* that also subtract to *-3*. The sign of the last term (-14) always determines whether the factors of the AC product add or subtract to equal the coefficient of the middle term.

2. Write your variable and factors that subtract to *-3* as a product of two binomials. The factors must be opposite signs in order to subtract.

$$(y - 7)(y + 4)$$

3. Divide each number by A, which is *2* from our original expression.

$$(y - \frac{7}{2})(y + \frac{4}{2})$$

4. Simplify and put any remaining denominator in front of the variable.

$$(y - \frac{7}{2})(y + 2)$$
→
Answer
$$\boxed{(2y - 7)(y + 2)}$$

Assisted Problem 1

Factor Completely: $6z^2 - z - 5$

Fill in the blanks:

$6z^2 - z - 5$

1•___
___•15
___•10
5•___

1. Multiply the 1st and 3rd coefficients to get ___. Then find factors of ___ that also subtract to ___. The sign of the last term (___) always determines whether the factors of the AC product add or subtract to equal the coefficient of the middle term.

2. Write your variable and factors that subtract to ___ as a product of two binomials.

$$(z - \_\_)(z + \_\_)$$

3. Divide each number by A, which is ___ from our original expression.

$$\left(z - \frac{6}{6}\right)\left(z + \frac{=}{6}\right)$$

4. Simplify, put any remaining denominator in front of the variable.

$$\left(z - \_\_\right)\left(z + \frac{=}{6}\right) \rightarrow \boxed{(z-1)(6z+5)}$$

Answer

PRACTICE PROBLEMS

1. $2x^2 - x - 15$

2. $3b^2 - 10b - 8$

3. $12c^2 - 17c - 5$

4. $3d^2 - 2d - 8$

5. $24f^2 - 76f + 40$

6. $3g^2 + 2g - 8$

7. $6h^2 - 23h + 10$

8. $3k^2 - 19k + 20$

9. $16m^3 - 32m^2 - 48m$

10. $3n^2 + 7n + 2$

11. $12p^2 - 5p - 2$

12. $-3v^2 + 16v + 12$

13. $16w^3 + 24w^2 - 16w$

14. $6x^2 + 7x - 20$

15. $4y^2 - 4y - 24$

16. $-6a^2 - 13a + 15$

17. $20d^2 - 46d + 24$

18. $6f^2 + 7f + 2$

19. $2 - g - 6g^2$

20. $10h + 8 - 3h^2$

21. $6n^2 - 5np + p^2$

22. $6r^2 + 15ru + 9u^2$

23. $-12a^2 - 10a + 42$

24. $2x^2 - 7x - 4$

25. $3x^2 - x - 4$

26. $5x^2 - x - 18$

27. $4x^2 - 17x + 15$

28. $6x^2 + 23x + 7$

29. $6x^2 - 23x + 7$

30. $3x^2 + 4x + 1$

ANSWERS TO PRACTICE PROBLEMS

181. $2x^2(5x+2)(7x+4)$

182. $3x(8x-1)(7x-1)$

183. $24x^3(3x+2)(2x+1)$

184. $(4m+5n)(3m-4n)$

185. $(3x-5)^2$

186. $(4c-3)(3c+5)$

187. $4(3a-2)(a-1)$

188. $(6y+7)(y+3)$

189. $(5r+3)(3r+7)$

190. $(7k+4)(2k+3)$

191. $3(3p+1)(9p+5)$

192. $(3q+5)(3q+4)$

193. $(4c-5)(3c+2)$

194. $(4x+3)(4x-5)$

195. $(8x-5)(3x-4)$

196. $(22n+3)(n+2)$

197. $(5r+4)(3r-4)$

198. $4x^2y(2y+3)(y-1)$

199. Prime

200. $(5x+2)^2$