Algebra 2 Worksheet
WS Completing the Square #1

Name: _____
Period: _____

I. Identify each conic section.

1. $\frac{1}{2}(2x^2)+5x-4=y^2$ $x^2+5x-4-y^2=0$ $x^2-y^2+5x-4=0$ Hyperbola	2. $x^2+(y-1)^2+4=y^2$ $(y-1)(y-1)$ $x^2+y^2-2y+1+4-y^2=0$ $x^2-2y+5=0$ Parabola
3. $7x^2-3x+4y^2=10-3y^2$ $7x^2-3x+4y^2+3y^2-10=0$ $7x^2+7y^2-3x-10=0$ Circle	4. $2x^2-3y^2+12+5y^2=x^2-6x+4$ $2x^2-3y^2+12+5y^2-x^2+6x-4=0$ $x^2+2y^2+6x+8=0$ Ellipse

II. Identify the conic section. Then rewrite in standard form by completing the square.

5. $\frac{2x^2}{2}+\frac{2y^2}{2}+\frac{8x}{2}-\frac{12y}{2}-\frac{24}{2}=\frac{0}{2}$ Circle $x^2+y^2+4x-6y-12=0$ $x^2+4x+\underline{4}+y^2-6y+\underline{9}=12+\underline{4}+\underline{9}$ $(x+2)^2+(y-3)^2=25$ $(x+2)^2+(y-3)^2=25$	6. $3x^2+12x-5y+7=0$ Parabola $3x^2+12x=5y-7$ $3(x^2+4x+\underline{4})=5y-7+\underline{12}$ $3(x+2)^2=5y+5$ $\frac{3(x+2)^2}{3}=\frac{5(y+1)}{3}$ $(x+2)^2=\frac{5}{3}(y+1)$
7. $4y^2-9x^2+16y+18x-29=0$ HYP $4y^2+16y-9x^2+18x=29$ $4(y^2+4y+\underline{4})-9(x^2-2x+\underline{1})=29+16-9$ $\frac{4(y+2)^2}{36}-\frac{9(x-1)^2}{36}=\frac{36}{36}$ $\frac{(y+2)^2}{9}-\frac{(x-1)^2}{4}=1$	8. $4x^2+9y^2-48x+72y+144=0$ Ellipse $4x^2-48x+9y^2+72y=-144$ $4(x^2-12x+\underline{36})+9(y^2+8y+\underline{16})=-144+144+144$ $\frac{4(x-6)^2}{144}+\frac{9(y+4)^2}{144}=\frac{144}{144}$ $\frac{(x-6)^2}{36}+\frac{(y+4)^2}{16}=1$

III. Rewrite the conic section in General Form

9. $\frac{\cancel{36}^{9}(x-1)^2}{\cancel{4}_{1}} - \frac{\cancel{36}^{4}(y+2)^2}{\cancel{9}_{1}} = 1 \cdot 36$

$9(x-1)^2 + 4(y+2)^2 = 36$

$9(x-1)(x-1) + 4(y+2)(y+2) = 36$

$9(x^2-x-x+1) + 4(y^2+2y+2y+4) = 36$

$9(x^2-2x+1) + 4(y^2+4y+4 = 36$

$9x^2-18x+9 + 4y^2+16y+16 = 36$

$9x^2+4y^2-18x+16y+9+16-36=0$

$9x^2+4y^2-18x+16y-11=0$

10. $(x-3)^2 = 4(y+2)$

$(x-3)(x-3) = 4y+8$

$x^2-3x-3x+9-4y-8=0$

$x^2-6x-4y+1=0$

$x^2-6x-4y+1=0$

11. $(x-5)^2+(y+1)^2=4$

$(x-5)(x-5)+(y+1)(y+1) = 4$

$x^2-5x-5x+25+y^2+1y+1y+1-4=0$

$x^2-10x+25+y^2+2y-3=0$

$x^2+y^2-10x+2y+22=0$

$x^2+y^2-10x+2y+22=0$

12. $\frac{\cancel{5}^{5}(x+1)^2}{3} - \frac{\cancel{15}^{15}(y+4)^2}{5} = 1 \cdot 15$

$5(x+1)^2 - 3(y+4)^2 = 15$

$5(x+1)(x+1) - 3(y+4)(y+4) = 15$

$5(x^2+x+x+1) - 3(y^2+4y+4y+16) = 15$

$5(x^2+2x+1) - 3(y^2+8y+16) = 15$

$5x^2+10x+5-3y^2-24y-48-15=0$

$5x^2-3y^2+10x-24y+5-48-15=0$

$5x^2-3y^2+10x-24y-58=0$