Beau Loney

Math 141
Quiz 7
Due Monday April 25th in class, not under my office door!

For each of the conics:
a. Identify class/type, b. write in standard form, and c. indicate position *(Which "way does it open?" or "Which direction does the major axis or the transverse axis lie?")*

1. $4x^2 + 32x + y^2 - 2y + 29 = 0$

Class/type: ellipse

$4x^2 + 32x + y^2 - 2y = -29$

$4(x^2 + 8x) + y^2 - 2y = -29$

$4(x^2 + 8x + 16) + y^2 - 2y + 1 = -29 + 64 + 1$

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

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

Standard Equation: $\frac{(x+4)^2}{9} + \frac{(y-1)^2}{36} = 1$

Direction: center $(-4, 1)$
major axis vertical

2. $9x^2 - 25y^2 + 36x + 50y - 214 = 0$

Class/type: hyperbola

$9x^2 + 36x \quad -25y^2 + 50y \quad = 214$

$9(x^2 + 4x \quad) - 25(y^2 - 2y \quad) = 214$

$9(x^2 + 4x + 4) - 25(y^2 - 2y + 1) = 214 + 36 - 25$

$9(x+2)^2 - 25(y-1)^2 = 225$

$$\frac{(x+2)^2}{25} - \frac{(y-1)^2}{9} = 1$$

Standard Equation: $\boxed{\frac{(x+2)^2}{25} - \frac{(y-1)^2}{9} = 1}$

Direction: center $(-2, 1)$
transverse axis: horizontal
opens left and right

3. $y^2 - 2y - 8x + 17 = 0$

Class/type: parabola

$y^2 - 2y = 8x - 17$

$y^2 - 2y + 1 = 8x - 17 + 1$

$(y-1)^2 = 8x - 16$

$(y-1)^2 = 8(x-2)$

Standard Equation: $(y-1)^2 = 8(x-2)$

Direction: vertex: $(2, 1)$
opens: right