Math 141
Quiz 7
Due Monday December 7th

Harrison Fire

For each of the conics:

a. Identify class/type, b. write in standard form, and c. indicate position, that is center/vertex and "Which way does it open?" or "Which direction does the major axis or the transverse axis lie?")
b. Provide your answers in the appropriate box. Thank you.

1. $x^2 + x + 2y - \frac{3}{4} = 0$

Class/type: parabola

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

Center/Vertex Direction: vertex $(-\frac{1}{2}, \frac{1}{2})$ opens down

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2. $4y^2 + 9x^2 + 18x - 27 = 0$

Class/type: ellipse

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

Center/Vertex Direction: center $(-1, 0)$ vertical major axis

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3. $25x^2 - 4y^2 + 50x + 16y - 91 = 0$

Class/type: hyperbola

Standard Equation: $\frac{(x+1)^2}{4} - \frac{(y-2)^2}{25} = 1$

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

$$x^2 + x + 2y - \frac{3}{4} = 0$$

$$x^2 + x = -2y + 3/4$$

$$x^2 + x + \frac{1}{4} = -2y + 3/4 + 1/4$$

$$(x + 1/2)^2 = -2y + 1$$

$$(x + 1/2)^2 = -2(y - 1/2)$$

opens down vertex $(-1/2, 1/2)$

$$4y^2 + 9x^2 + 18x - 27 = 0$$

$$4y^2 + 9x^2 + 18x = 27$$

$$4y^2 + 9(x^2 + 2x \quad) = 27$$

$$4y^2 + 9(x^2 + 2x + 1) = 27 + 9$$

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

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

center $(-1, 0)$ major axis vertical

$$25x^2 - 4y^2 + 50x + 16y - 91 = 0$$

$$25x^2 + 50x - 4y^2 + 16y = 91$$

$$25(x^2 + 2x \quad) - 4(y^2 - 4y \quad) = 91$$

$$25(x^2 + 2x + 1) - 4(y^2 - 4y + 4) = 91 + 25 - 16$$

$$25(x+1)^2 - 4(y-2)^2 = 100$$

$$\frac{(x+1)^2}{4} - \frac{(y-2)^2}{25} = 1$$

center $(-1, 2)$ transverse axis horizontal

opens left and right