Twenty-fifth Set of Homework

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Due: Monday May 2

Please note: You should fully justify your answers.

Hyperbolas

1. Sketch a graph of the following hyperbolas. The graph should correctly identify, the vertices, center, foci and asymptotes.
   (a) $\frac{x^2}{9} - \frac{y^2}{4} = 1$
   (b) $\frac{x^2}{9} - \frac{y^2}{4} = -1$
   (c) $\frac{x^2}{4} - \frac{y^2}{4} = -1$
   (d) $\frac{x^2}{4} - \frac{y^2}{4} = 1$
   (e) $\frac{x^2}{16} - \frac{y^2}{9} = 1$
   (f) $y^2 - 4x^2 = 36$
   (g) $x^2 - y^2 = 1$
   (h) $x^2 - y^2 = -4$
   (i) $25x^2 - 4y^2 = 100$
2. Sketch a graph of the following hyperbolas. The graph should correctly identify, the vertices, center, foci and asymptotes.
   (a) $xy = 4$
   (b) $xy = 9$
   (c) $xy = -4$
   (d) $xy = 5$
3. **Extra Credit:** Find an equation of the hyperbola with foci at $(-\sqrt{2}, -\sqrt{2})$ and $(\sqrt{2}, \sqrt{2})$ and the absolute value of the differencte of the distances of a point in it from the foci is $2\sqrt{2}$.