EXAM 4 - MATH 131 Friday, April 16

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Consider the parabola with equation $3x + y^2 + 8y + 4 = 0$. Find its vertex, focus and directrix.

(b) Find an equation for the parabola with focus $(-5, 7)$ and directrix $x = -1$.

2. (a) An ellipse has equation $\dfrac{(x-1)^2}{16} + \dfrac{(y+1)^2}{25} = 1$. Find its center, vertices and foci.

(b) Find an equation for the ellipse with center at $(0, 3)$, minor axis of length 4 and one of its foci at $(-3, 3)$.

3. (a) A hyperbola has equation $x^2 - y^2 - 6x + 8y - 3 = 0$. Find its center, vertices, foci and asymptotes.

(b) Find an equation for the hyperbola with vertices at $(6, 3)$ and $(2, 3)$ and foci at $(7, 3)$ and $(1, 3)$.

4. (a) Write in logarithmic form $2^x = 5$.

(b) Write in exponential form $\log_3 \frac{1}{7} = y$.

(c) Find the domain of $f(x) = \log_{3/2}(3x - 7)$.

5. (a) Expand as a sum/difference of logarithms: $\ln\left(\dfrac{x^3\sqrt[5]{y^2}}{z^7}\right)$

(b) Write as a single logarithm: $\frac{1}{2}\log_3 x - \log_3 y + 2\log_3(x + 2)$.