MATH-9 TEST 5 (Unit 5 - Polynomials: Zeros and Graphs, Conics, Rational Fcns.)

Sample

100 points NAME:_____

Be sure to clearly show your work on test. On the GRAPHS, use grid wisely and plot only necessary points.

In problems 1-5, fill in the blank with the most appropriate answer. (2 points each)

(1) True or False: If $x^3 - 2x^2+4x-8$ has any real zeros, they are included in the list: $\{\pm 1, \pm 2, \pm 4, \pm 8\}$. _____

(2) The graph of f(x) = $\frac{2x^2 - x - 2}{x - 3}$ has a slant asymptote, y = _____

(3) For $f(x) = \frac{5x^2}{3x^2 - 3}$ as $x \to \infty$, $y \to$ _____

(4) Given y = $\frac{5}{(x-1)(x+4)}$, as $x \to 1^+$, $y \to$ _____.

(5) The graph of $p(x) = 2(x-1)(x+3)^2$ (turns/crosses)_____at x intercept x= -3.

(6) Identify the type of each of the following conics. (2 points each)
(Assume none are degenerate)

a) $x^2 - 4x - 8y + 8 = 0$ _____

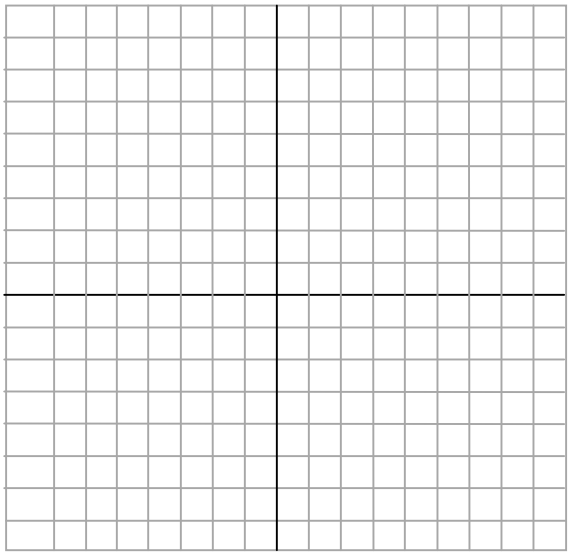
b) $6x^2 + 2y^2 - 6x + 18y - 9 = 0$ _____

c) $x^2 - 4y^2 - 6x - 24y - 63 = 0$ _____

(7) Carefully sketch the graph of $2y^2 + 8x + 4y - 14 = 0$, and find the following desired information. Label at least 2 points on your graph and show scale.
(11 points)

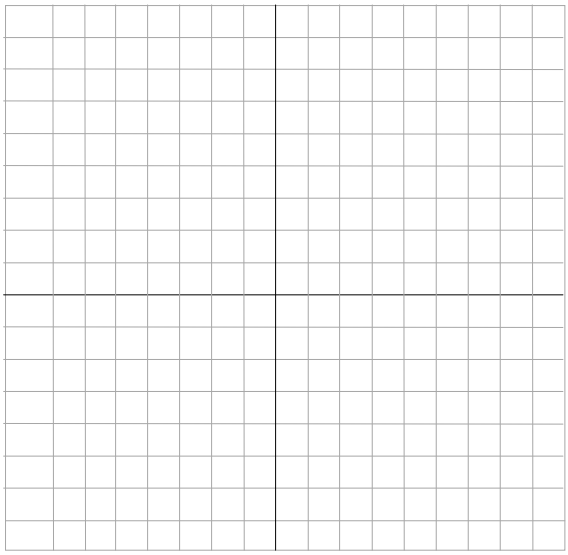
VERTEX: _____ FOCUS: _____

EQUATION OF DIRECTRIX: _____ FOCAL DIAMETER: _____



(8) Carefully sketch the graph of $9x^2 + 4y^2 - 72x + 8y + 112 = 0$, and find the following desired information. Label at least 2 points on your graph and show scale. (11 points)

VERTICES: _____ FOCI: _____ COVERTICES: _____



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(9) Find an equation of the ellipse with foci (2,1) and (2,-3) and major axis of length 6. (10 points)

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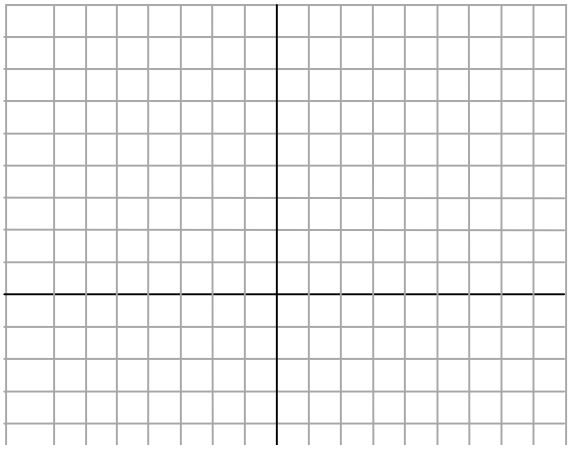
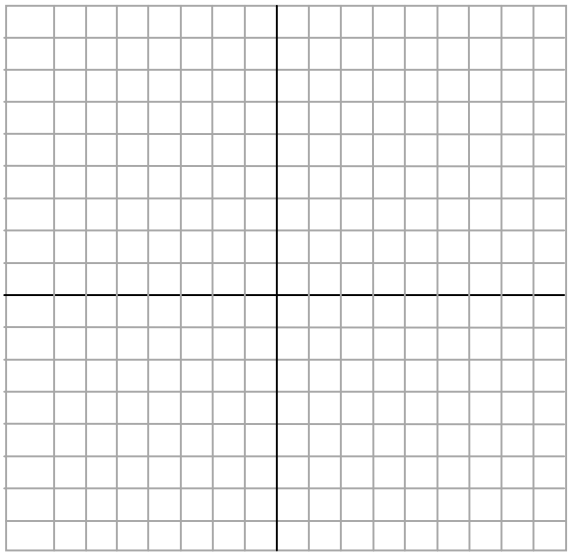
(10) Sketch the graph of $y = \frac{1}{6}(x-1)^2(x+2)^2(x+3)$. Show work. Discuss end behavior and behavior near the x intercepts. Also find the y intercept. (11 points)



(11) Sketch the graph of $y = \dfrac{x^3}{2(x-1)^2(x+1)}$. Show details. (12 points)



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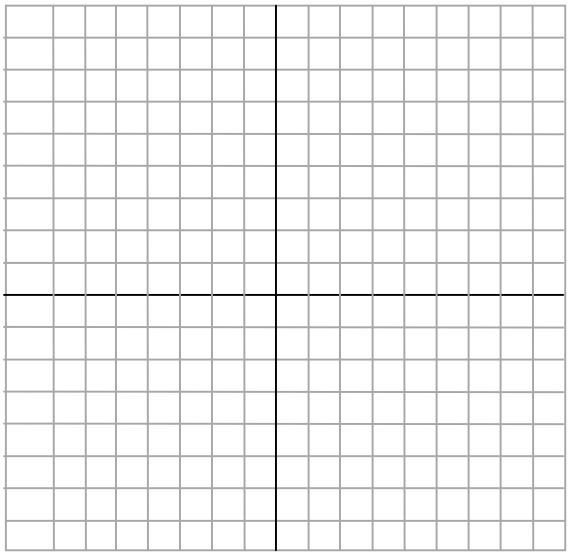
(12) Carefully sketch the graph of $\dfrac{(x-3)^2}{9} - \dfrac{(y+1)^2}{25} = 1$, and find the following desired information. Label at least 2 points on your graph and show scale.

(10 points)

CENTER: _____ VERTICES: _____ FOCI: _____



(13) $f(x) = 2x^4 + x^3 - 17x^2 - 16x + 12$

(a) Find the zeros of f(x). Show all work, In particular show the list of possible rational zeros and show all that you checked.

(b) Sketch the graph. Use knowledge of behavior near x intercepts and end behavior, do not make a table of points. Show work in an organized manner.

(20 points)