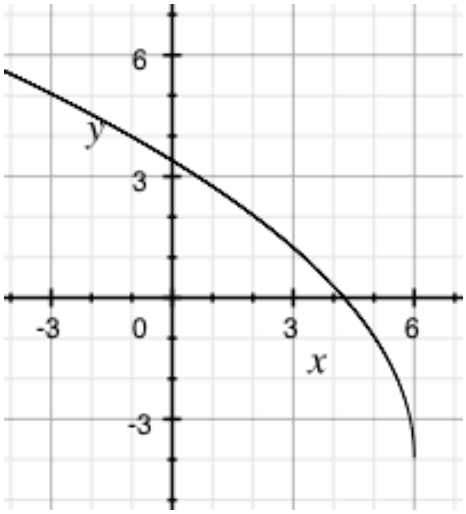
Name: _____ Date: _____

Radical & Polynomial Functions Assignment

Please show all of your work for the questions below. Write your solutions on a separate piece of paper with the question numbers clearly labelled. Due the class before the test! (15 marks total)

1. Write the equation of a radical function for the graph below. Show your reasoning. (1 mark)



2. Given $f(x)=-\left(\frac{x+3}{2}\right)^2+4$, sketch the graphs of the following functions on grid paper (below or separate) using the same set of axes. Clearly label each graph. Be accurate with key points (e.g., invariant points, max and min points) on the graph. (3 marks)

   a) $y=f(x)$ b) $y=\sqrt{f(x)}$ c) $y=\sqrt{f\left(\frac{x}{2}\right)}-6$

3. a) Solve the equation $4-x=\sqrt{6-x}$ algebraically. (2 marks)
   b) Solve the equation $x+3=\sqrt{12-2x^2}$ graphically. (1 mark)

4. Use your math expertise (or research skills!) to devise a method for doing synthetic division using addition. Clearly illustrate your technique with an example. Then compare it to the way we learned synthetic division in class. Which do you prefer and why? (2 marks)

5. Divide $10x^4-11x^3-8x^2+7x+9$ by $2x-3$. Express in the form $\frac{P(x)}{x-a}=Q(x)+\frac{R}{x-a}$. (1 mark)

6. Determine the values of *m* and *n* so that the polynomials $2x^3+mx^2-nx-4$ and $x^3-3mx^2+2nx+4$ are both divisible by $x+2$. No marks for guess and check! (2 marks)

7. a) Fully factor $f(x)=x^4-3x^3-7x^2+15x+18$ without the use of technology. (1 mark)
   b) Explain how one could use the factored form to sketch the graph of $y=f(x)$. Then graph the function. (1 mark)
8. Write the equation of a polynomial function for the graph below. Show your reasoning. (1 mark)