Math 371 ASSIGNMENT 17, WINTER 2016 **Due at the start of class 3/7**

For each of the following,

- rewrite the given function in the form $f(x) = Ax^a + Bx^b + Cx^c + \cdots$
- determine the derivative
- re-write your final answer without negative or fractional exponents
- give your answer using correct notation that agrees with the name given to the original function

1. $y = 5x^3 - 7x^2 + x - 3$
2. $f(x) = \dfrac{3}{2x^4}$
3. $g(x) = \dfrac{3x^2}{2}$
4. $f(x) = 5x^2 + x - \dfrac{6}{x^2}$
5. $y = 3\sqrt{x}$
6. $h(x) = \dfrac{4}{\sqrt{x}}$
7. $y = \dfrac{4}{x} - 3\sqrt{x^5}$
8. $g(x) = 7\sqrt[3]{x}$

9. (a) Use your calculator or *Desmos* to graph $f(x) = \sqrt{x}$. Sketch the graph **neatly** for $0 \le x \le 10$.
   (b) Draw in tangent lines at $x = 1$, $x = 4$ and $x = 9$.
   (c) As $x \to \infty$, what do the slopes of the tangent lines appear to do? **Answer with a question and answer sentence.**
   (d) Give the derivative function $f'(x)$ without negative or fractional exponents. Then make a table of values for x and $f'(x)$ for $x = 1, 4, 9, 49, 100$. Do your results appear to support your answer to part (c)?

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