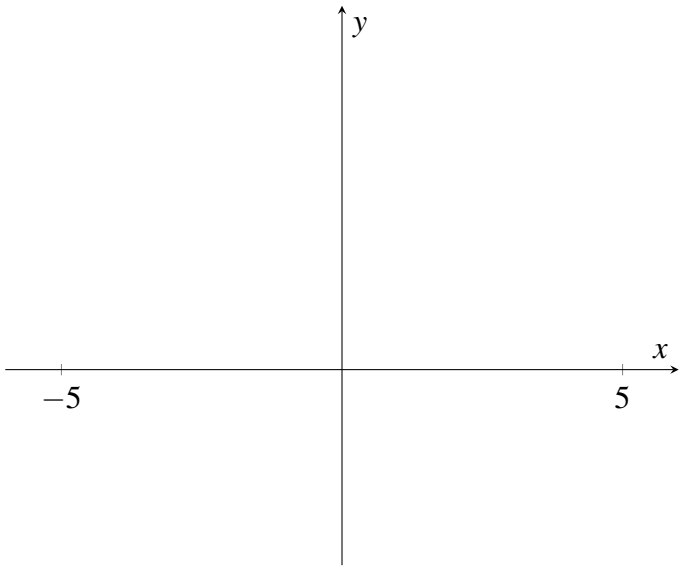
**Name:** _____ _____ **/ 30**

There are 30 points possible on this quiz. No aids (book, calculator, etc.) are permitted. Show all work for full credit.

1. **[5 points]** Sketch a function on $[-5,5]$ that has an absolute maximum value of 3 at $x=-4$, an absolute minimum value of $-2$ at $x=4$, and a local minimum at $x=0$. You should appropriately label notable values on the $x$- and $y$-axes for full credit.




2. **[5 points]** Find all critical numbers (a.k.a. critical points) of the function $f(x)=x(x-1)^{2/3}$. Be careful!

**3. [10 points]** Find the maximum and minimum values of the function $f(x) = 1/x - 2/x^2$ on the interval $[1, 10]$.

**4. [5 points]** Suppose $f$ is continuous on $[-2, 2]$ and has a derivative at each point in $(-2, 2)$. Suppose $f(-2) = -2$ and $f(2) = 3$. What does the Mean Value Theorem let you conclude?

**5. [5 points]** Draw a diagram that illustrates the Mean Value Theorem in the context of the previous problem. Your illustration should include a tangent line somewhere.