

1.
 - a. Sketch two different functions whose derivative is $y' = 4$. In each case; give the rule for the original function and check the derivative is $y' = 4$.
 - b. How many possible functions satisfy this requirement?
 - c. Suppose $y(1) = 3$ and $y' = 4$; what is the original function now? Show work.
 - d. Sketch $y' = 4$ and the function you determined in part c) together.

2.
 - a. Sketch two different functions whose derivative is $y' = -4x$. In each case; give the rule for the original function and check the derivative is $y' = -4x$.
 - b. How many possible functions satisfy this requirement?
 - c. Suppose $y(-1) = 8$ and $y' = -4x$; what is the original function now? Show work.
 - d. Sketch $y' = -4x$ and the function you determined in part c) together.

3.
 - a. Sketch two different functions whose derivative is $y' = 3x^2 + 1$. In each case; give the rule for the original function and check the derivative is $y' = 3x^2 + 1$.
 - b. How many possible functions satisfy this requirement?
 - c. Suppose $y(0) = 1$ and $y' = 3x^2 + 1$; what is the original function now? Show work.
 - d. Sketch $y' = 3x^2 + 1$ and the function you determined in part c) together.

4.
 - a. Sketch two different functions whose derivative is $y' = 3\cos(x)$. In each case; give the rule for the original function and check the derivative is $y' = 3\cos(x)$.
 - b. How many possible functions satisfy this requirement?
 - c. Suppose $y(0) = 1$ and $y' = 3\cos(x)$; what is the original function now? Show work.
 - d. Sketch $y' = 3\cos(x)$ and the function you determined in part c) together.