4.8 Anti-Derivatives

**Before:** Given a function find its derivative

**Now:** Given a function’s derivative, find the function

\[ f'(x) = 8 \]
\[ f(x) = \]

**Reverse Power Rule**

\[ f'(x) = x^n \quad f'(x) = x^4 \quad f'(x) = 3x^2 + 2x^3 - 5 \]
\[ f(x) = \quad f(x) = \quad f(x) = \]
for all ________
\[ f(x) = \]

\[ f'(x) = \sin x - 3\sec^2 x \Rightarrow f(x) = \]

\[ f'(x) = \sqrt{x} + x^2 - \frac{1}{x^2} = \]
\[ f(x) = \]
\[ f(4) = 30 \]

If given a point on the function, we can ________.

\[ f''(x) = 2x^3 + 3x^2 - 4x + 5 \quad f(0) = 2 \quad f(1) = 0 \]

\[ f'(x) = \]

\[ f(x) = \quad f(0) = 2 \Rightarrow \quad \]

\[ f(1) = \quad \Rightarrow \]

\[ f(x) = \]

A car braked with a constant deceleration of 16 ft./sec\(^2\).
producing skid marks measuring 200 ft. before coming to a stop.
How fast was the car traveling when the brakes were first applied?
\[ a(t) = -16 \quad \text{The anti-derivative of acceleration is} \quad \]

We call the beginning of the skid \( \_ \). We need to find the
time it takes \( \quad \). \( \leftarrow y = \_ \)

The anti-derivative of velocity is \( \_ \).

At the beginning of the skid \( \_ \). \( \leftarrow \_ = \_ \)

At the end of the skid \( \_ \). \( \leftarrow \_ = \_ \)