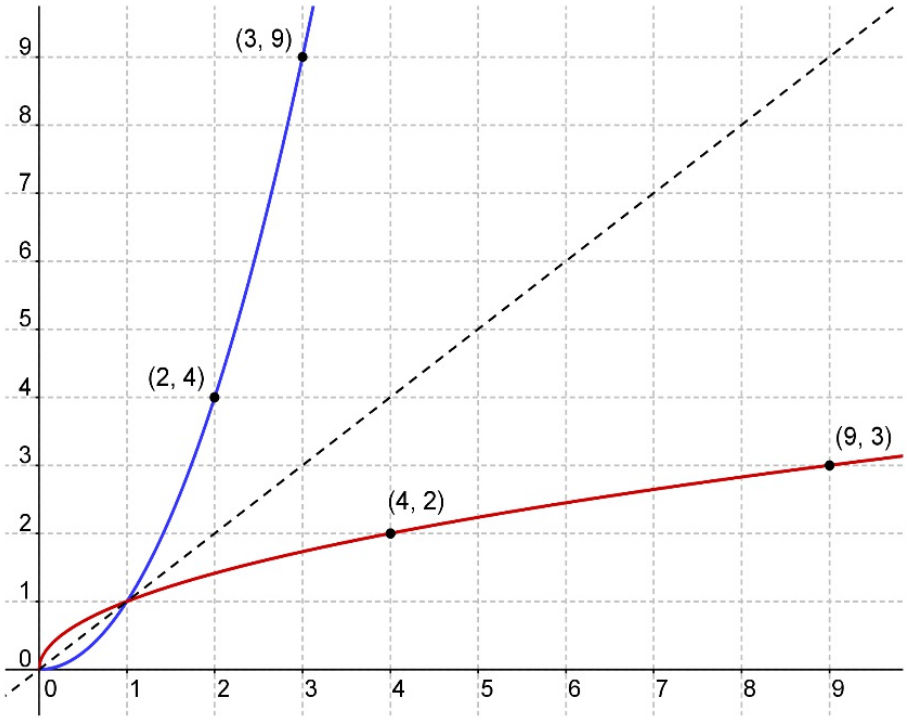
Inverse Functions and Their Derivatives

Quick Note on Inverses

1. An inverse function of f(x) is the reflection over y = x

2. If f(x) has a point (x,y), then $f^{-1}(x)$ has a point (y,x). The domain of f becomes the range of f^{-1} and the range of f becomes the domain of f^{-1}.

3. We can find inverses algebraically by switching the x and y around and then solve for y.



1 2 3

Inverse Functions and Their Derivatives

Find the inverse of f(x):

1. $f(x) = 4x - 7$

2. $f\left(x\right) = 2x^5 - 5$

3. $f\left(x\right) = \sqrt{9 - x^2}$

1 2 3

Inverse Functions and Their Derivatives

Let $f(x) = \frac{2x-1}{4}$, find $f^{-1}(x)$ when $x = 2$

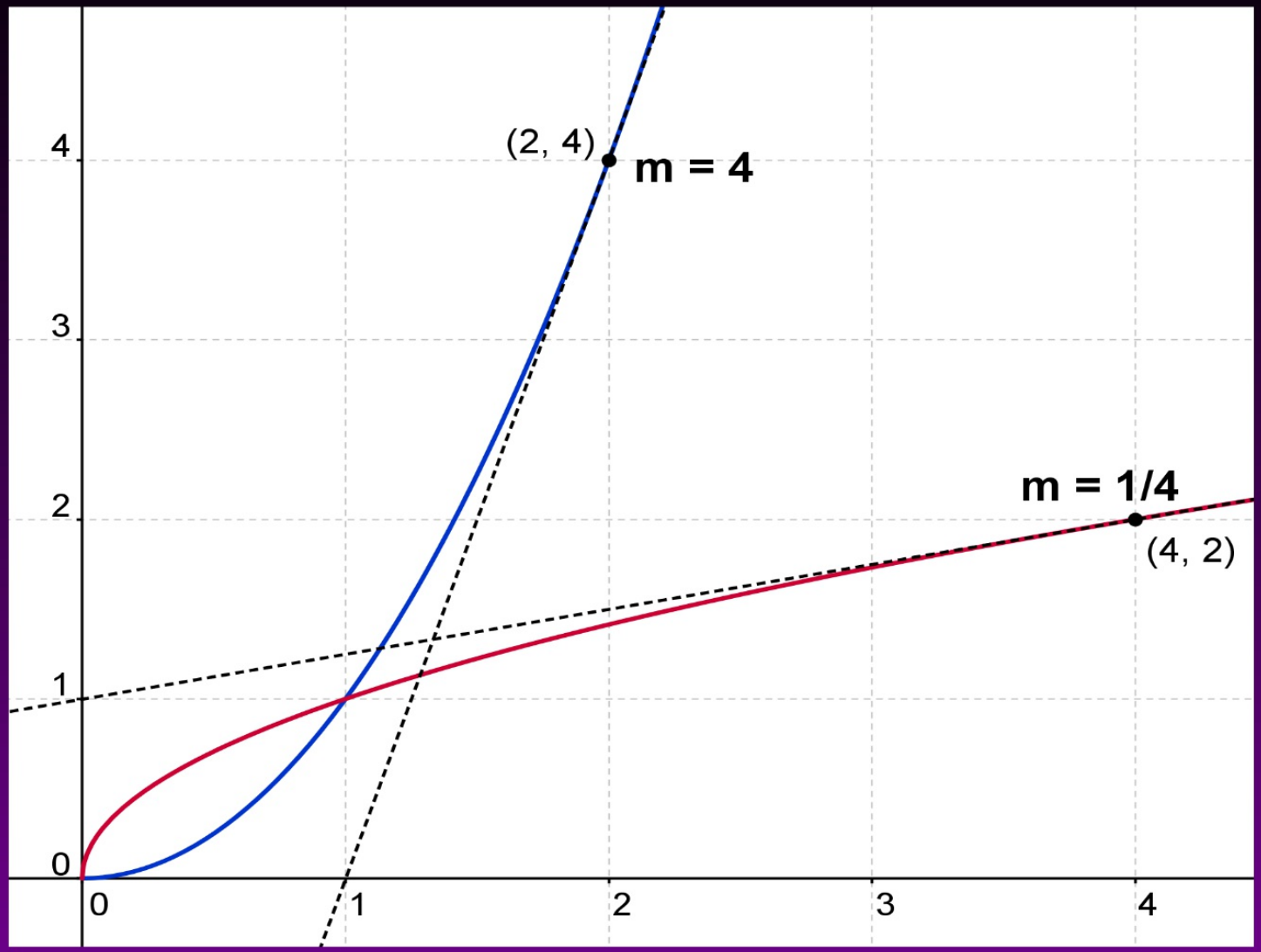
1 2 3

Inverse Functions and Their Derivatives

Let $f(x) = x^2 - 5x + 1$, find $f^{-1}(x)$ when $x = 3$

1 2 3

The Derivative of an Inverse



1 2 3 4

The Derivative of an Inverse

Find $(f^{-1})'(a)$ if $a = 2$ and $f(x) = 3x + 4$

1 2 3 4

The Derivative of an Inverse

Find $(f^{-1})'(a)$ if $a = 1$ and $f(x) = \cos x$ and $0 \leq x \leq \frac{\pi}{2}$

1 2 3 4

The Derivative of an Inverse

Find $(f^{-1})'(a)$ if $a = 4$ and $f(x) = x^3 - 4x^2 + 1$

1 2 3 4

The Derivative of an Inverse

Let f be a differentiable function such that $f(5) = 15$, $f(4) = 5$, $f'(5) = -7$, and $f'(4) = -2$. The function g is differentiable and $g(x) = f^{-1}(x)$ for all x. What is the value of $g'(5)$?

1 2 3 4

Homework: p. 347# 29-39 odd, 71-75 odd