CALCULUS
Derivatives of inverse functions
(The Inverse Function Theorem)

NEW
Differentiate \( y = \arccos \left( e^x + \frac{6}{\sqrt{x}} \right) \).

Differentiate \( Q(r) = \left[ e^{\pi r} - e \right] \arccos \left( r \sqrt{2} \right) \).

Differentiate \( u(t) = \sec(\arcsin t) \).

Differentiate \( v(s) = \arctan \left[ \sqrt{\frac{3 + s}{3 - s}} \right] \).
0440-5. Draw a graph of a 1-1 function $f$
which passes through (4, 5)
and whose tangent line at (4, 5) has slope $1/3$.
In the same picture,
draw that tangent line.
In the same picture,
draw a right triangle whose
hypotenuse is on the tangent line
and whose legs have lengths 1 and 3.
In a separate picture, reflect,
through the $45^\circ$ line,
everything in the previous picture.
Let $g := f^{-1}$.

What are the values of $f(4)$ and $f'(4)$?
What are the values of $g(5)$ and $g'(5)$?