CALCULUS
Derivatives of inverse functions
(The Inverse Function Theorem)

NEW

0440-1. NEW Differentiate $y = \arccos\left(e^x + \sqrt[6]{x}\right)$.

0440-2. NEW Differentiate $Q(r) = \left[e^{\pi r - e}\right]\left[\arccos\left(r^{\sqrt{2}}\right)\right]$.

0440-3. NEW Differentiate $u(t) = \sec(\arcsin t)$.

0440-4. NEW Differentiate $v(s) = \arctan\left[\sqrt{\dfrac{3+s}{3-s}}\right]$.

0440-5. NEW 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° 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 $g'(5)$?