Differentiation hints

1.

a) use multiplier rule, sums rule and the formula $dx^n/dx = nx^{n-1}$

b) use chain rule

c) use chain rule

d) Leibniz

e) quotient

f) Leibniz

2. Add and subtract $f(x)/g(a)$ to the numerator of the difference quotient.

3. Use implicit differentiation (differentiate the equation with respect to t)

4. $(x^{p/q})^q = x^p$

7. Use Leibniz rule twice.

There are 2 ways to check your answers in 1. You can do d) and f) in 2 different ways and check if you get the same answer.

You can also calculate the difference between the derivative and the difference quotient, that is

$f'(a) - (f(x) - f(a))/(x - a)$

for $x - a$ small, if this difference falls off approximately proportionally to $x - a$, your answer is very likely to be correct. This approach applies to all

of them, as well as to 7 (pick some $f, g,$ and h and see if it works out).

Use your calculator to calcucate.