Mathematica Labs | Denis Shubleka

Subject: Calculus

Topic: Higher Order Derivatives

Goal: Use *Mathematica* to compute higher order derivatives.

Task 1

Let's define a function $f(x)$ and compute its second deriative, using two single quotation marks.

```
f[x_] := Cos[x^3];
f''[x]
```

Three quotation marks are used for the third derivative of $f(x)$. Try it:

```
f'''[x]
```

The command D[$f(x)$,{x,degree}] can also be used to compute higher order derivatives. The following finds the fifth derivative of the given function:

```
D[f[x], {x, 5}]
```

To find the fifth derivative and evaluate it at $x=3$, we use:

```
D[f[x], {x, 5}] /. x → 3
```

Your turn: find the 50th derivative of $g(x)=\sec x$ and evaluate at $x=1$.

Related Exercises/Notes:
