Answer on Question #58169 – Math – Calculus

Question

Assume f(x)is a function differentiable at the points 0 and 1 with
$f(0)=-2$, $f'(0)=-1$, $f(1)=1$ and $f'(1)=0$,
and assume $F(x)=f(\sin(x))$.

Compute
F'(0)=
F'(pi/2)=

Solution

By the chain rule

$(g\circ f)'(z) = g'(f(z))\,f'(z)$.

In this case we get:

F' (x)=(f(sin(x)))'= f' (sin(x))·(sin(x))'= f' (sin(x))·cos(x)

F'(0)= f' (sin(0))·cos(0)= f' (0)·1=(-1)·1=-1

F'(pi/2)= f' (sin(pi/2))·cos(pi/2)= f' (1) ·cos(pi/2)=0·0=0.

Answer: F' (0)= =-1; F' (pi/2)= 0.