Answer on Question #81342 – Math – Calculus

Question

Show that the function $f(x)=x-4+\cos(-2x)$ is even, odd, or neither. Algebraically.

Solution

The function $f(x)$ is odd if $f(-x)=-f(x)$ for all x in the domain of function $f(x)$.
The function $f(x)$ is even if $f(-x)=f(x)$ for all x in the domain of function $f(x)$.
Note that the domain of function $f(x)$ contains all real number and
$f(-x)=(-x)-4+\cos(-2(-x))=-x-4+\cos(2x)$.
Note that the function Cosine is even, so $\cos(-2x)=\cos(2x)$, therefore
$f(x)=x-4+\cos(2x)$.
Consider
$-f(x)=-(x-4+\cos(2x))=-x+4-\cos(2x)$.
We see that $f(-x)\neq -f(x)$ and $f(-x)\neq f(x)$, hence $f(x)$ is neither even nor odd.

Answer: the function $f(x)=x-4+\cos(-2x)$ is neither even nor odd.