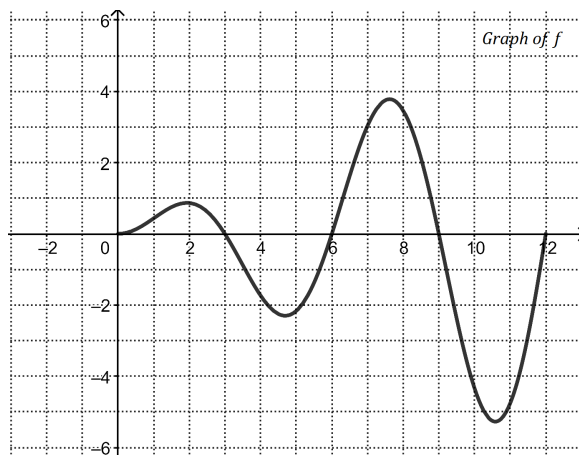1. Suppose we are given the below data about $f : [0, \frac{\pi}{4}] \to \mathbb{R}$.

$f(0)$	$f(\frac{\pi}{4})$	$f(\frac{\pi}{2})$
0	$\frac{1}{\sqrt{2}}$	1

    (a) Use the part (c) to provide an approximation of $\int_0^{\frac{\pi}{4}} f(x)dx$.

    (b) Suppose $f(x) = \sin(x)$ then quantify the error in each approximation.

    (c) Are their functions for which the approximation(s) will be exact ?

2. The graph of a function $f(t)$ is shown. Use it to answer the following questions.

    (a) Using 1(c) provide an approximation of the **average value** of this function over the interval $[4, 12]$.

    (b) Can you provide a better approximation of the same using 1(c) ?