I) Evaluate the following integral:

a- $\displaystyle\int_0^{\frac{\pi}{2}} cos\theta \cdot cos\big(sin\theta\big)d\theta$

b- $\displaystyle\int_1^2 (x+1)(x^2+2x)^3 dx$

II) Given the following graph of a function $f(x)$.
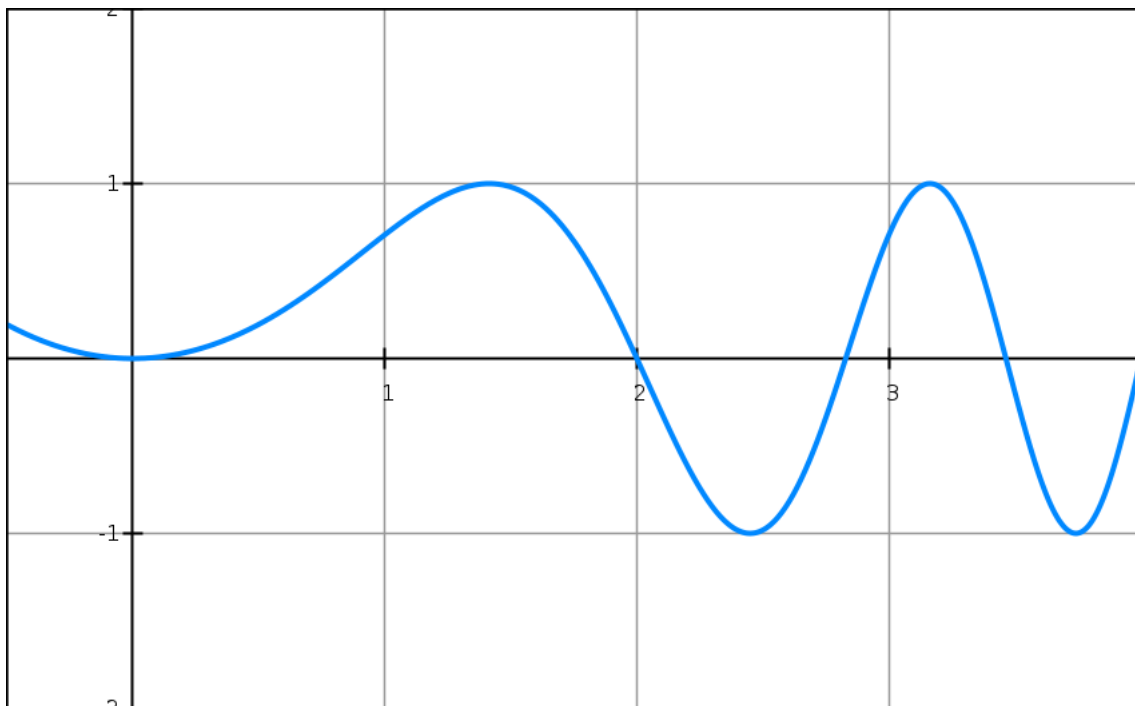
Define $g(x) = \int_0^x f(t)dt$ on the interval $[0,4]$.

a- At what value x does g have an absolute maximum on $[0,4]$.

b- At what value x does g have an absolute minimum on $[0,4]$.

c- On what interval is g increasing.