4. [13 points]

    a. [6 points] Compute

$$\int_0^1 f'(x)\sin(2\pi x)dx$$

    where $f(x)$ is given by the following table.

x	0	.25	.5	.75	1
$f(x)$	.8	.5	1.2	1	.4

    b. [7 points] Find

$$\int x^3 \cos x^2 dx.$$