

No books or notes allowed. No laptop, graphic calculator or wireless devices allowed. Write clearly.

Name: _____

1. (10 points) Compute the following definite integral:

$$\int_0^{\frac{\pi}{2}} \sin(x) \sqrt{1 + \cos(x)} dx.$$

Solution:

Calling $u = 1 + \cos(x)$ we have $du = -\sin(x)dx$ so that

$$\int_0^{\frac{\pi}{2}} \sin(x) \sqrt{1 + \cos(x)} dx = - \int_2^1 \sqrt{u} du = \int_1^2 \sqrt{u} du = \frac{2}{3} u^{\frac{3}{2}} \Big|_1^2 = \frac{2}{3} (\sqrt{2} - 1)$$