

1. Evaluate the following integrals

a.  $\int 28(7x - 2)^{-5} dx.$

b.  $\int_0^1 \frac{9r^2 dr}{\sqrt{1 - r^3}}.$

c.  $\int \csc^2(2\theta) \cot(2\theta) d\theta.$

d.  $\int 8z(z^2 - 1)^{1/3} dz.$

e.  $\int_1^4 \frac{10\sqrt{v}}{(1 + v^{3/2})^2} dv.$

f.  $\int \tan^2(a) \sec^2(a) da.$

g.  $\int \frac{\cos(\sqrt{x})}{\sqrt{x} \sin^2(\sqrt{x})} dx.$

h.  $\int_0^{\pi/4} (1 - \sin(2t))^{3/2} \cos(2t) dt.$

2. The velocity of a particle moving back and forth on a line is given by

$$v = \frac{ds}{dt} = 6 \sin(2t) \text{ m/s.}$$

If  $s(0) = 0$ , find  $s(\pi/2)$ .