

Solutions

Each answer shows the steps, then the **result**.

2.1

- $\sqrt{36 + 64} = 10$

2.2

- $\int_0^3 \sqrt{(2t)^2 + 2^2} dt = \int_0^3 \sqrt{4t^2 + 4} dt$

2.3

- $\vec{r}(t) = \langle 4t + 1, 3t^2 + 2 \rangle$

3.1 C

- total distance is the arc-length integral of speed

3.2

(a)

- $\vec{r}(t) = \langle t^3, t^2 + 1 \rangle$

(b)

- $\vec{v}(1) = \langle 3, 2 \rangle$; speed $= \sqrt{9 + 4} = \sqrt{13}$

3.3

- speed $= \sqrt{\cos^2 t + \sin^2 t} = 1$; distance $= \int_0^\pi 1 dt = \pi$