(19.) $|E| = \left|\frac{f^{(3)}(x^*)}{3!} x^3\right|$ $\quad f^{(3)}(x) = e^x$ (10)

$|f^{(3)}(x)| \le |e^x| \le e^2$

$\therefore E \le \frac{e^2 x^3}{6}$ (d)

(20.) $ds = |\vec{v}|\,dt$ $\quad \vec{v} = \vec{r}\,'(t) = (-2\sin t, 2\cos t, 3)$

$|\vec{v}| = \sqrt{2^2+3^2} = \sqrt{13}$

$ds = \sqrt{13}\,dt$

$\int_0^{10} ds = \sqrt{13}\int_0^{10} dt = 10\sqrt{13}$ (c)