

$$\begin{aligned}
 \text{(a) } \int_C \mathbf{F} \cdot d\mathbf{r} &= \int_0^1 \langle e^{t^4-1}, t^9 \rangle \cdot \langle 4t^3, 5t^4 \rangle dt = \int_0^1 (4t^3 e^{t^4-1} + 5t^{13}) dt \\
 &= \left[e^{t^4-1} + \frac{5}{14} t^{14} \right]_0^1 = \frac{19}{14} - 1/e
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) } \mathbf{r}(0) &= \mathbf{0}, \quad \mathbf{F}(\mathbf{r}(0)) = \langle e^{-1}, 0 \rangle; \\
 \mathbf{r}\left(\frac{1}{\sqrt{2}}\right) &= \left\langle \frac{1}{4}, \frac{1}{4\sqrt{2}} \right\rangle, \quad \mathbf{F}\left(\mathbf{r}\left(\frac{1}{\sqrt{2}}\right)\right) = \left\langle e^{-3/4}, \frac{1}{16\sqrt{2}} \right\rangle; \\
 \mathbf{r}(1) &= \langle 1, 1 \rangle, \quad \mathbf{F}(\mathbf{r}(1)) = \langle 1, 1 \rangle.
 \end{aligned}$$

