

1) Let $\mathbf{r}(t) = \langle t^2, 4t \rangle$ Note: When $t = 1$, $\mathbf{r}(1) = \langle 1, 4 \rangle$

a) Find $\mathbf{r}'(t) =$ _____

b) Find $\mathbf{r}'(1) =$ _____

c) Explain how to draw the vectors $\mathbf{r}(1)$ and $\mathbf{r}'(1)$?

2) Let $\mathbf{r}(t) = \langle \cos t, \sin t \rangle$ Note: When $t = \pi$, $\mathbf{r}(\pi) = \langle -1, 0 \rangle$

a) Find $\mathbf{r}'(t) =$ _____

b) Find $\mathbf{r}'(\pi) =$ _____

c) Explain how to draw the vectors $\mathbf{r}(\pi)$ and $\mathbf{r}'(\pi)$?

3) Let $\mathbf{r}(t) = \langle \cos t, \sin t, t^3 \rangle$

a) Find $\mathbf{r}(\pi/2) =$ _____

b) Find $\mathbf{r}'(t) =$ _____

c) Find $\mathbf{r}'(\pi/2) =$ _____

4) Let $\mathbf{r}(t) = \langle t - 8, t^2, t^3 \rangle$

a) Find $\mathbf{r}(2) =$ _____

b) Find $\mathbf{r}'(t) =$ _____

c) Find $\mathbf{r}'(2) =$ _____

5) Let $\mathbf{r}(t) = \langle \sqrt{t-4}, t^{2/3}, t^3 \rangle$

a) Find $\mathbf{r}(10) =$ _____

b) Find $\mathbf{r}'(t) =$ _____

c) Find $\mathbf{r}'(10) =$ _____

6) Let $\mathbf{r}(t) = \langle e^{2t}, e^{t^2}, e^{t^3} \rangle$

a) Find $\mathbf{r}(0) =$ _____

b) Find $\mathbf{r}'(t) =$ _____

c) Find $\mathbf{r}'(0) =$ _____

7) Let $\mathbf{r}(t) = \langle 4 \cos t, 6 \sin t, 7 \tan t \rangle$

a) Find $\mathbf{r}'(t) =$ _____

b) Find $\mathbf{r}''(t) =$ _____

c) $\mathbf{r}'(t) \cdot \mathbf{r}''(t) =$ _____

d) $\mathbf{r}'(t) \times \mathbf{r}''(t) =$ _____

8) Let $\mathbf{r}(t) = \langle e^{-2t}, e^{-4t^2}, e^{-5t^3} \rangle$

a) Find $\mathbf{r}'(t) =$ _____

b) Find $\mathbf{r}''(t) =$ _____

c) Find $\mathbf{r}'(t) \cdot \mathbf{r}''(t) =$ _____

d) Find $\mathbf{r}'(t) \times \mathbf{r}''(t) =$ _____

9) Let $\mathbf{r}(t) = \langle e^{2t}, e^{4t}, e^{-5t} \rangle$

Find $\int \mathbf{r}(t) dt =$ _____

10) Let $\mathbf{r}(t) = \left\langle \sqrt{t}, \frac{t^2}{5}, 9t \right\rangle$

Find $\int \mathbf{r}(t) dt =$ _____

11) Let $\mathbf{r}'(t) = \langle t, t^2, t^3 \rangle$ and $\mathbf{r}(0) = \langle 0, 1, 2 \rangle$

Find $\mathbf{r}(t)$.

12) Let $\mathbf{r}'(t) = \langle \sin t, \cos t, \tan t \rangle$ and $\mathbf{r}(0) = \langle 0, 0, 0 \rangle$

Find $\mathbf{r}(t)$.