

Exercise 12.1

Assignment 16

Date _____

Q1

Domain:-

$$r(t) = \cos t \, i - 3t \, j$$

$$\cos t$$

$$(-\infty, +\infty)$$

$$-3t$$

$$(-\infty, +\infty)$$

Intersection of above domains
 $(-\infty, +\infty)$

value of $r(t_0)$:

$$t_0 = \pi$$

$$r(t_0) = (\cos \pi) i - 3(\pi) j$$

$$r(t_0) = -i - 3\pi j$$

Q2

Domain:-

$$r(t) = \cos \pi t \, i - \ln t \, j + \sqrt{t-2} \, k$$

$$\cos \pi t$$

$$(-\infty, +\infty)$$

$$\ln t$$

$$(0, +\infty)$$

$$\sqrt{t-2}$$

$$t-2 \geq 0$$

$$t \geq 2$$

$$[2, +\infty)$$

intersection of above domains
 $[2, +\infty)$

value of $r(t_0)$

$$t_0 = 3$$

$$r(t_0) = \cos 3\pi i - \ln(3)j + \sqrt{1}k$$

$$r(t_0) = -i - \ln 3 j + k$$

Q5

$$x = 3 \cos t, \quad y = t + \sin t$$

$$x(t) = 3 \cos t \quad y(t) = t + \sin t$$

$$r = x(t)i + y(t)j$$

$$\boxed{r = 3 \cos t i + (t + \sin t) j}$$

Q7

$$r = 3t^2 i - 2j$$

$$r = x(t)i - y(t)j$$

$$x = 3t^2 \quad y = -2$$

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Q9

$$r = (3 - 2t)i + 5tj$$

$$x = 3 - 2t$$

$$y = 0 + 5t$$

A line L is passing through point $(3, 0)$ in 2 space and parallel to the vector $-2i + 5j$

Q11

$$r = 2ti - 3j + (1 + 3t)k$$

$$x = 0 + 2t$$

$$y = -3 + 0t$$

$$z = 1 + 3t$$

A line in 3-space passing through $(0, -3, 1)$ and parallel to the vector $2i + 3k$