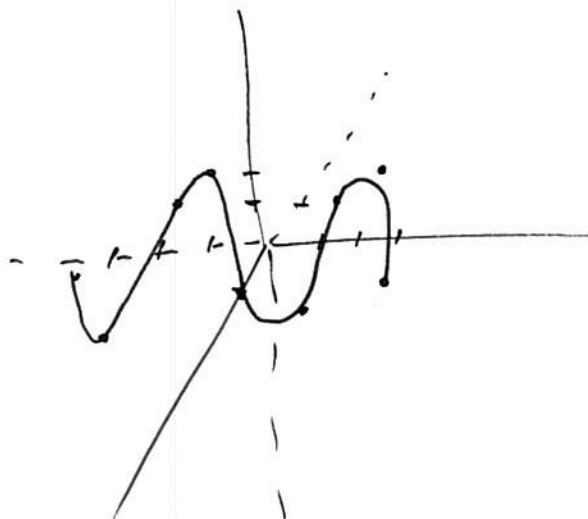


Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Sketch the graph of the vector-valued function $\vec{r}(t) = \cos t \hat{i} - t \hat{j} + 2 \sin t \hat{k}$. Use 10 points, and at least 2 full cycles.

t	x	y	z
-2π	1	2π	0
$-3\pi/2$	0	$3\pi/2$	2
$-\pi$	-1	π	0
$-\pi/2$	0	$\pi/2$	-2
0	1	0	0
$\pi/2$	0	$-\pi/2$	2
π	-1	$-\pi$	0
$3\pi/2$	0	$-3\pi/2$	-2
2π	1	-2π	0



2. Using the function in #1, find the following:

a. $\vec{r}'(t) =$

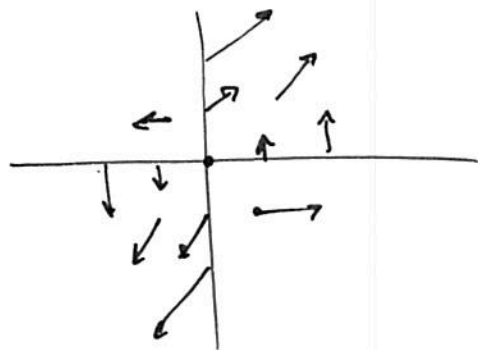
$$-\sin t \hat{i} - \hat{j} + 2 \cos t \hat{k}$$

b. $\int \vec{r}(t) dt$

$$= (\sin t + C_1) \hat{i} - \left(\frac{1}{2}t^2 + C_2\right) \hat{j} + (2 \cos t + C_3) \hat{k}$$

3. Sketch the vector field $\vec{F}(x, y) = y\hat{i} + (x + y)\hat{j}$. Sketch at least 15 points by hand. Verify your graph with technology and include that graph with your solution.

x	y	F
0	0	$\langle 0, 0 \rangle$
1	0	$\langle 0, 1 \rangle$
0	1	$\langle 1, 1 \rangle$
-1	0	$\langle 0, -1 \rangle$
0	-1	$\langle -1, -1 \rangle$
1	1	$\langle 1, 2 \rangle$
1	-1	$\langle -1, 0 \rangle$
-1	-1	$\langle -1, -2 \rangle$
-1	1	$\langle 1, 0 \rangle$
2	0	$\langle 0, 2 \rangle$



x	y	F
-2	0	$\langle 0, -2 \rangle$
0	2	$\langle 2, 2 \rangle$
0	-2	$\langle -2, -2 \rangle$

