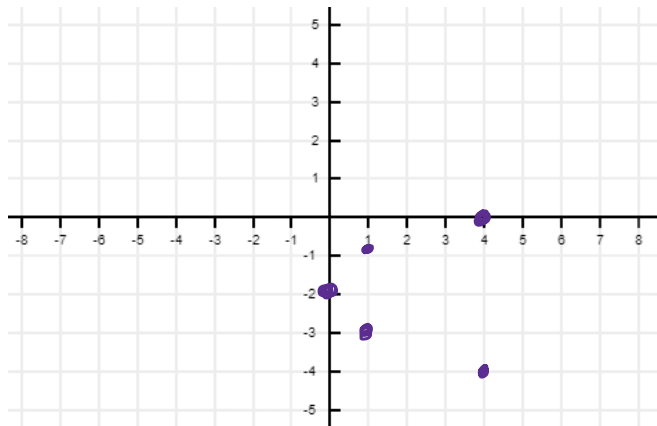


Directions: For the given vector-valued functions, complete the table and sketch the graph that the endpoints make.

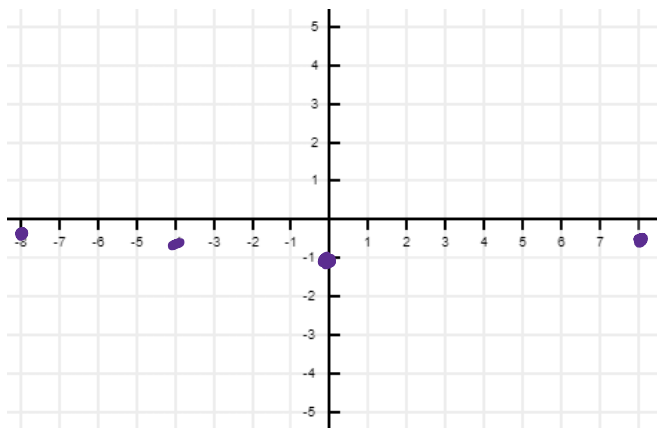
1) $f(t) = \langle t^2, t - 2 \rangle$.

t	x	y
-2	4	-4
-1	1	-3
0	0	-2
1	1	-1
2	4	0



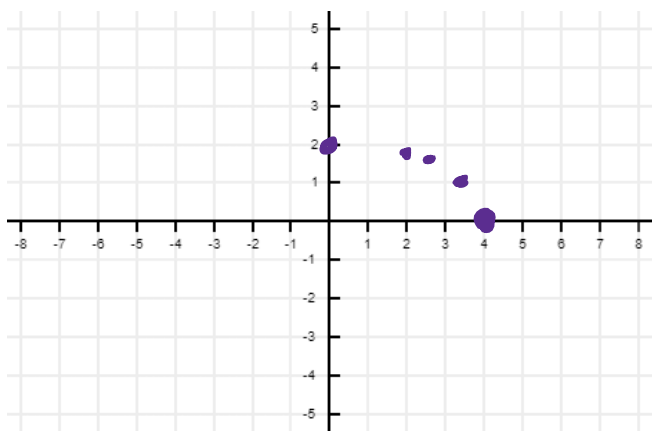
2) $f(t) = \left\langle t + 4, \frac{4}{t} \right\rangle$

t	x	y
-12	-8	-1/3
-8	-4	-1/2
-4	0	-1
0	4	DNE
4	8	1/2



3) $f(t) = \langle 4 \cos t, 2 \sin t \rangle$

t	x	y
0	4	0
$\frac{\pi}{6}$	$2\sqrt{3} \approx 3.46$	1
$\frac{\pi}{4}$	$2\sqrt{2} \approx 2.8$	$\sqrt{2} \approx 1.4$
$\frac{\pi}{3}$	2	$\sqrt{3} \approx 1.73$
$\frac{\pi}{2}$	0	2



Directions: Find the domains of each of the components of the vector-valued function, then find the domain of the vector-valued function.

4) $f(t) = \langle 3t - 4, \frac{3}{t} \rangle$

X Comp Domain: \mathbb{R}

Y Comp Domain: $(-\infty, 0) \cup (0, \infty)$

Function Domain: $(-\infty, 0) \cup (0, \infty)$

5) $f(t) = \langle \sqrt{x} - 3, \frac{t}{t-5} \rangle$

X Comp Domain: $(0, \infty)$

Y Comp Domain: $(-\infty, 5) \cup (5, \infty)$

Function Domain: $(0, 5) \cup (5, \infty)$

6) $f(t) = \langle 2t^3, |t| \rangle$

X Comp Domain: \mathbb{R}

Y Comp Domain: \mathbb{R}

Function Domain: \mathbb{R}

7) $f(t) = \langle \sqrt{t-3}, \frac{2t}{t-6} \rangle$

X Comp Domain: $(3, \infty)$

Y Comp Domain: $(-\infty, 6) \cup (6, \infty)$

Function Domain: $(3, 6) \cup (6, \infty)$

Directions: Describe the motion and find the speed of a particle in motion with the following vector at the given time.

8) $v(t) = \langle -4 \cos t, 8 \sin t \rangle, t = \frac{\pi}{4}$

$\langle -4 \cos \frac{\pi}{4}, 8 \sin \frac{\pi}{4} \rangle$

$\langle -4(\frac{\sqrt{2}}{2}), 8(\frac{\sqrt{2}}{2}) \rangle$

$\langle -2\sqrt{2}, 4\sqrt{2} \rangle$

@ $t = \frac{\pi}{4}$ it is moving left and up.

$\|v\| = \sqrt{(-2\sqrt{2})^2 + (4\sqrt{2})^2} = \sqrt{8 + 32} = \sqrt{40}$

9) $v(t) = \langle 2(t-3)^2, \sqrt{2t-3} \rangle, t = 6$

$\langle 2(6-3)^2, \sqrt{2(6)-3} \rangle$

$\langle 18, 3 \rangle$

$\|v\| = \sqrt{18^2 + 3^2}$

$= \sqrt{333} \approx 18.25$

ITS moving right and up at this speed

10) $v(t) = \langle \frac{5t-4}{t}, 2t^3 \rangle, t = -2$

$\langle \frac{5(-2)-4}{-2}, 2(-2)^3 \rangle = \langle 7, -16 \rangle$

$\|v\| = \sqrt{7^2 + (-16)^2} = \sqrt{305} \approx 17.46$

ITS MOVING RIGHT AND DOWN AT THIS SPEED

11) $v(t) = \langle \frac{-t^2-5}{t}, -\sqrt{t-4} \rangle, t = 5$

$\langle \frac{-5^2-5}{5}, -\sqrt{5-4} \rangle$

$\langle -6, -1 \rangle$

$\|v\| = \sqrt{(-6)^2 + (-1)^2}$

$= \sqrt{36+1} = \sqrt{37} \approx 6.083$

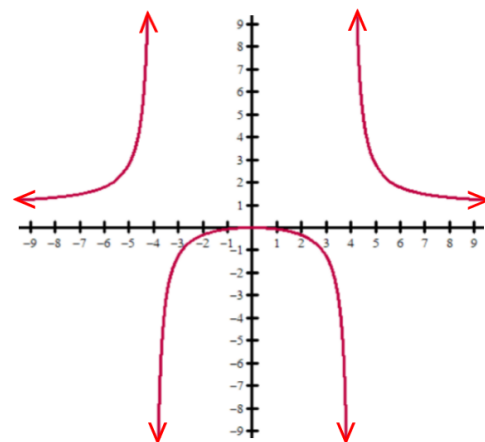
IT IS MOVING LEFT AND DOWN AT THIS SPEED

4.9 Vector Valued Functions

4.9 Test Prep

12. (1.9) Given the graph of f . Which of the following describes the function

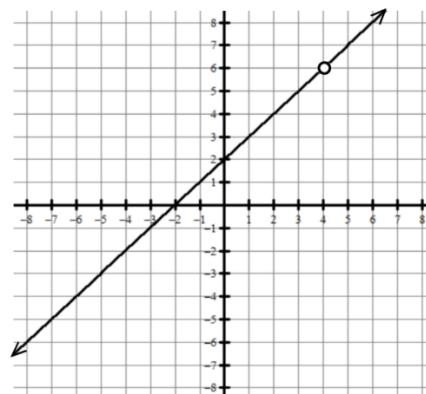
- (A) $\lim_{x \rightarrow -4^-} f(x) = -\infty$ and $\lim_{x \rightarrow -4^+} f(x) = -\infty$
- (B) $\lim_{x \rightarrow -4^-} f(x) = \infty$ and $\lim_{x \rightarrow -4^+} f(x) = -\infty$
- (C) $\lim_{x \rightarrow -4^-} f(x) = -\infty$ and $\lim_{x \rightarrow -4^+} f(x) = \infty$
- (D) $\lim_{x \rightarrow -4^-} f(x) = \infty$ and $\lim_{x \rightarrow -4^+} f(x) = \infty$
- (E) $\lim_{x \rightarrow -4} f(x) = f(0)$



12. (1.10) The figure shows the graph of a function f . Which of the following could be an expression for the $f(x)$?

- (A) $\frac{(x+2)(x-4)}{(x+2)}$
- (B) $\frac{(x-2)(x+4)}{(x-2)}$
- (C) $\frac{(x+2)(x-4)}{(x-4)}$
- (D) $\frac{(x-2)(x+4)}{(x+4)}$

hole @ $x = 4$
 so $\frac{(x+2)}{(x+4)}$



graph of f