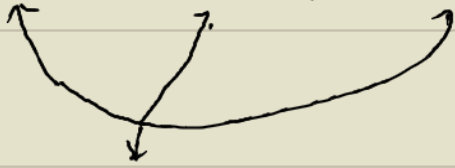


# VECTOR VALUED FUNCTION

$$\vec{r}(t) = f(t)\vec{i} + g(t)\vec{j} + h(t)\vec{k}$$



COMPONENT FUNCTIONS

ex:  $\vec{r}(t) = \cos t \vec{i} + \sin t \vec{j} + t \vec{k}$

$$x = \cos t \quad y = \sin t$$

$$x^2 = \cos^2 t \quad y^2 = \sin^2 t$$

$$x^2 = \cos^2 t$$

$$y^2 = \sin^2 t$$

$$x^2 + y^2 = \cos^2 t + \sin^2 t$$

$$x^2 + y^2 = 1$$

ex:  $f(x) = \frac{2}{x-7}$

$$x-7=0$$

$$x=7$$

$$x \neq 7$$

$$(-\infty, 7) \cup (7, \infty)$$

ex:  $g(x) = \sqrt{4x-3}$

$$4x-3 \geq 0$$

$$4x \geq 3$$

$$x \geq \frac{3}{4}$$

$$\left[\frac{3}{4}, \infty\right)$$

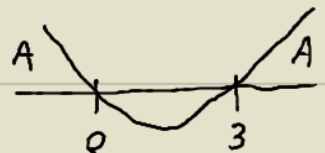
ex:  $h(x) = \sqrt{x^2-3x}$

$$x^2-3x \geq 0$$

$$x(x-3) \geq 0$$

$$x=0 \quad x-3=0$$

$$x=0 \quad x=3$$



$$(-\infty, 0] \cup [3, \infty)$$

ex:  $i(x) = \ln(x-5)$

$$x-5 > 0$$

$$x > 5$$

$$(5, \infty)$$

ex:

$$j(x) = \tan x$$

$$= \frac{\sin x}{\cos x}$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$

$$\left[0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{2}\right) \cup \left(\frac{3\pi}{2}, 2\pi\right)$$

$$\left(\frac{\pi n}{2}, \frac{\pi(n+2)}{2}\right) \quad n \text{ IS ODD}$$