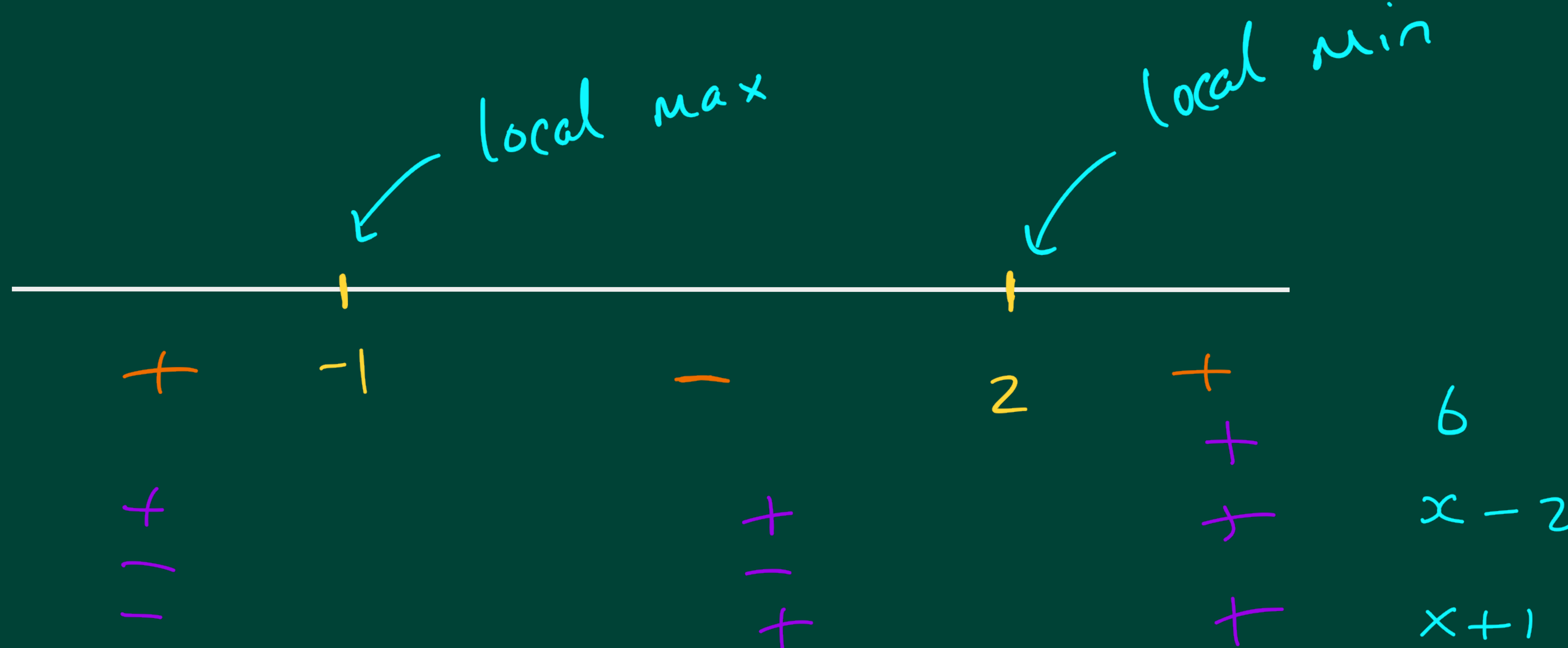
$$f'(x) = 6x^2 - 6x - 12 = 6(x^2 - x - 2)$$

$$= 6(x-2)(x+1)$$

$f'(x) = 0$ @ 2 and -1

$$f'(x) = 6(x-2)(x+1)$$



$$f(x) = x^{1/3}(x^2-4)$$

$$f'(x) = \frac{1}{3}x^{-2/3}(x^2-4) + x^{1/3}(2x)$$

$$= \frac{x^2-4}{3x^{2/3}} + x^{1/3}(2x)$$

Critical pt @ $x=0$ as $f'(0)$ is undefined.

Say $\dfrac{x^2-4}{3x^{2/3}} + x^{1/3}(2x) = 0, \quad x \neq 0$

$$x^2-4 + 3x^{2/3}x^{1/3}2x = 0$$

$$x^2 - 4 + 6x^2 = 0$$

$$7x^2 - 4 = 0$$

$$7x^2 = 4$$

$$x^2 = 4/7$$

$$x = \pm 2/\sqrt{7}$$

$$f'(x) = \frac{7x^2 - 4}{3x^{2/3}} = \frac{7\left(x - 2/\sqrt{7}\right)\left(x + 2/\sqrt{7}\right)}{3x^{2/3}}$$

$$f'(x) = \frac{7x^2 - 4}{3x^{2/3}} = \frac{7\left(x - 2/\sqrt{7}\right)\left(x + 2/\sqrt{7}\right)}{3x^{2/3}}$$

		$-2/\sqrt{7}$		0 (Spooky)		$2/\sqrt{7}$		
	+		−		−		+	
	−		−		−		+	$x - 2/\sqrt{7}$
	−		+		+		+	$x + 2/\sqrt{7}$
	+		+		+		+	$(x^{1/3})^2$

@ $\frac{-2}{\sqrt{7}}$ we have a local max

@ $\frac{2}{\sqrt{7}}$ we have a local min

@ 0 we have $f'(0)$ undefined.

$$f(x) = x^{1/3}(x^2-4)$$

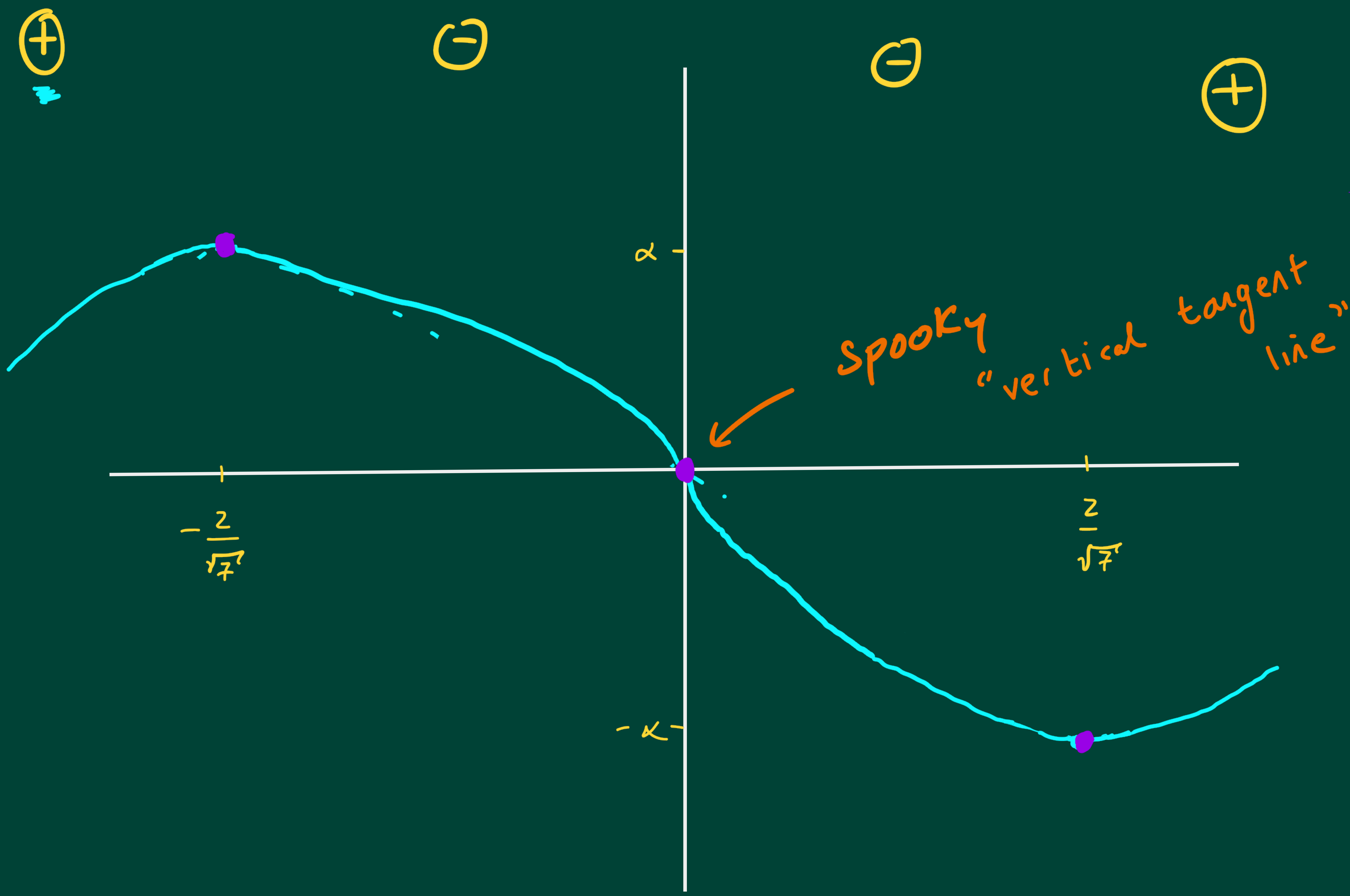
$$f(-2/\sqrt{7}) = \left(\frac{-2}{\sqrt{7}}\right)^{1/3}\left(\left(\frac{-2}{\sqrt{7}}\right)^2 - 4\right)$$

$$= \left(\frac{-2}{\sqrt{7}}\right)^{\frac{1}{3}}\left(\frac{-24}{7}\right) > 0$$

$$f\left(\frac{2}{\sqrt{7}}\right) = \left(\frac{2}{\sqrt{7}}\right)^{1/3}\left(\left(\frac{2}{\sqrt{7}}\right)^2 - 4\right)$$

$$= \underbrace{\left(\frac{2}{\sqrt{7}}\right)^{1/3}\left(\frac{-24}{7}\right)}_{-\alpha} < 0$$

$$f(0) = 0$$



⊕
⊖
⊖
⊕
α
−α
$-\frac{2}{\sqrt{7}}$
$\frac{2}{\sqrt{7}}$
spooky
"vertical tangent line"