

Piecewise Functions WS

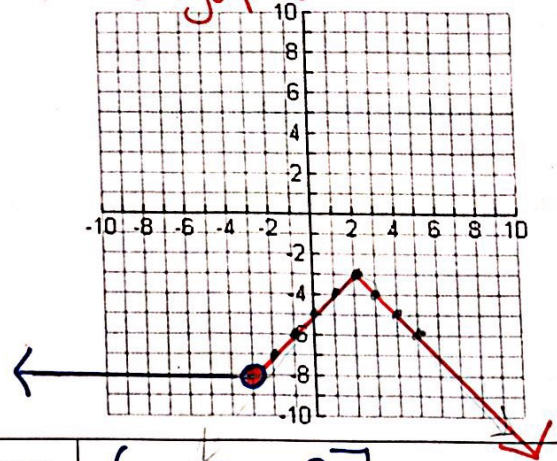
$$1. f(x) = \begin{cases} -8, & x < -3 \\ -|x-2|-3, & x \geq -3 \end{cases}$$

$y = -8$
 $y = -|x-2|-3$
 $v: (2, -3)$

A function is continuous if it does not have any holes or gaps.

Is this function continuous on its domain? Why or why not?

Yes, because there aren't any holes or gaps.



Domain	$(-\infty, +\infty)$	Range	$(-\infty, -3]$
Zero(s)	None	y-int	$(0, -5)$

$$2. f(x) = \begin{cases} \sqrt[3]{x+5} + 3, & x \leq 3 \\ (x-5)^2, & x > 3 \end{cases}$$

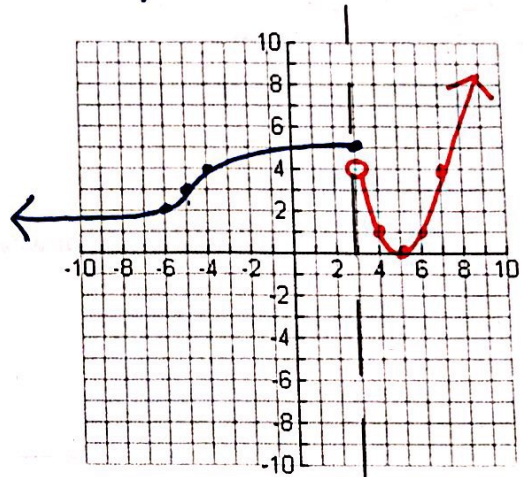
$\sqrt[3]{0+5} + 3 = y$
 $\sqrt[3]{5} + 3 = y$

$0 = \sqrt[3]{x+5} + 3 \quad x = -32$

$-3 = \sqrt[3]{x+5}$
 $-27 = x+5$

Is this function continuous on its domain? Why or why not?

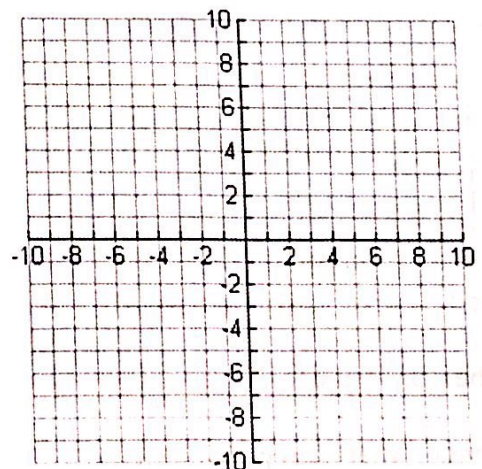
No, because there is a jump at $x = 3$



Domain	$(-\infty, +\infty)$	Range	$(-\infty, +\infty)$
Zero(s)	$(5, 0)$ $(-32, 0)$	y-int	$(0, \sqrt[3]{5+3})$

$$3. f(x) = \begin{cases} |x+6| - 4, & -10 < x < -3 \\ \sqrt{9-x^2}, & -3 < x \leq 3 \\ -\frac{2}{3}x - 4, & 3 < x \leq 9 \end{cases}$$

Is this function continuous on its domain? Why or why not?



Domain		Range	
Zero(s)		y-int	