## WRITE INEQUALITY IN INTERVAL NOTATION

$x \leq 2 \Rightarrow (-\infty, 2]$

$-2 < x \leq 5 \Rightarrow (-2, 5]$

$x > 9 \Rightarrow (9, \infty)$

## WRITE INTERVAL AS AN INEQUALITY

$(-\infty, 4) \Rightarrow x < 4$

$[-1, 3] \Rightarrow -1 \leq x \leq 3$

$[2, \infty) \Rightarrow x \geq 2$

## SOLVE THE INEQUALITIES

$\frac{2}{5}(x-6) \geq x-1$

$5 \cdot \frac{2}{5}(x-6) \geq 5 \cdot (x-1)$

$2x - 12 \geq 6x - 5$

$-2x \quad\quad -2x$

$-12 \geq 3x - 5$

$+5 \quad\quad +5$

$-7 \geq 3x$

$\frac{-7}{3} \geq x$ or $x \leq -\frac{7}{3}$

$\Rightarrow x \in (-\infty, -\frac{7}{3}]$

$2(x+3) > 2x + 1$

$2x + 6 > 2x + 1$

$-2x \quad\quad -2x$

$6 > 1$ TRUE

$\Rightarrow x \in (-\infty, \infty)$

ANSWER THE QUESTIONS ABOUT THE GIVEN FUNCTION

$f(x) = \frac{\sqrt{x-2}}{x+5}$

1 IS THE POINT $(3, \frac{1}{10})$ ON THE GRAPH OF $f$?

$f(3) = \frac{\sqrt{3-2}}{3+5} = \frac{\sqrt{1}}{8} = \frac{1}{8} \Rightarrow (3, \frac{1}{8})$ $(3, \frac{1}{10})$ NO

2 IF $x=6$, WHAT IS $f(x)$? WHAT POINT IS ON THE GRAPH

$f(6) = \frac{\sqrt{6-2}}{6+5} = \frac{\sqrt{4}}{11} = \frac{2}{11}$ $\left(6, \frac{2}{11}\right)$

3 FIND THE DOMAIN OF $f(x)$

$f(x) \frac{\sqrt{x-2}}{x+5} \Rightarrow$ $x-2 \geq 0$ $x+5 \neq 0$

$x \geq 2$ $x \neq -5$

$[2, \infty)$ $(-\infty, -5) \cup (-5, \infty)$

Domain $[2, \infty)$


4 IF $f(x) = 0$ WHAT IS $x$? WHAT POINT IS ON THE GRAPH

$\frac{\sqrt{x-2}}{x+5} = 0 \Rightarrow \sqrt{x-2} = 0$ $(2, 0)$

$x-2=0$

$x=2$

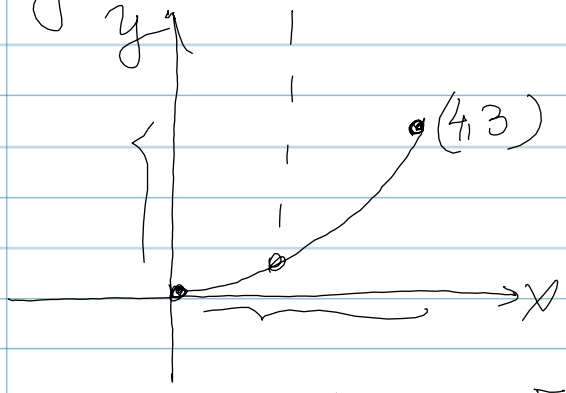
5 LIST $x$-intercepts $\Rightarrow (2, 0)$ $y=0 \Rightarrow \frac{\sqrt{x-2}}{x+5} = 0$

6 LIST $y$-intercept $\Rightarrow$ $x=0$

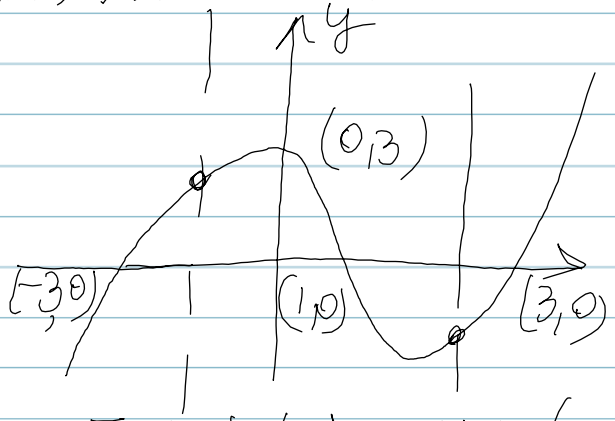
$\frac{\sqrt{0-2}}{0+5} \Rightarrow \frac{\sqrt{-2}}{5} \Rightarrow$ Not possible Not real $\Rightarrow$ NO $y$-int

$0 \in [2, \infty) \Rightarrow$ NO $y$-int

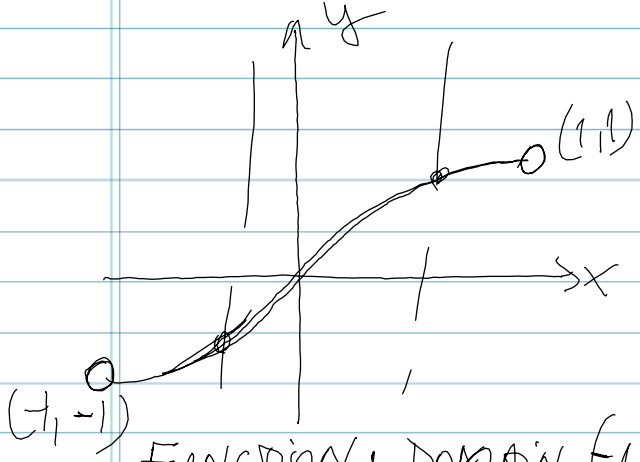
DETERMINE WHETHER THE GRAPH IS THAT OF A FUNCTION BY USING A VERTICAL LINE TEST, IF IT IS A FUNCTION OR NOT FIND: THE DOMAIN, THE RANGE, THE INTERCEPTS IF ANY AND THE SYMMETRY WITH RESPECT TO x-AXIS y-AXIS OR THE ORIGIN USING THE GRAPHS:



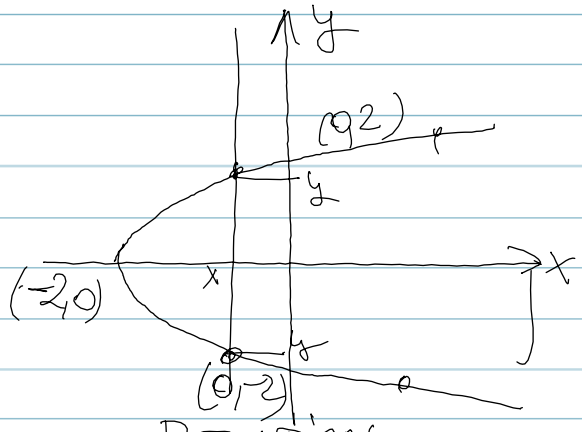

FUNCTION: DOMAIN $[0,4]$
RANGE $[0,3]$
x-int } $(0,0)$
y-int }
NO SYMMETRY




FUNCTION: DOMAIN $(-\infty,\infty)$
RANGE $(-\infty,\infty)$
x-int: $(-3,0)$ $(1,0)$ $(3,0)$
y-int: $(0,3)$
NO SYMMETRY




FUNCTION: DOMAIN $(-1,1)$
RANGE $(-1,1)$
x-int } $(0,0)$
y-int }
SYMMETRIC WITH RESPECT TO THE ORIGIN




RELATION
DOMAIN $[-2,\infty)$
RANGE $(-\infty,\infty)$
x-int $(-2,0)$
y-int $(0,2),(0,-2)$
SYMMETRIC WITH RESPECT TO x-AXIS