Domain and Range Notes

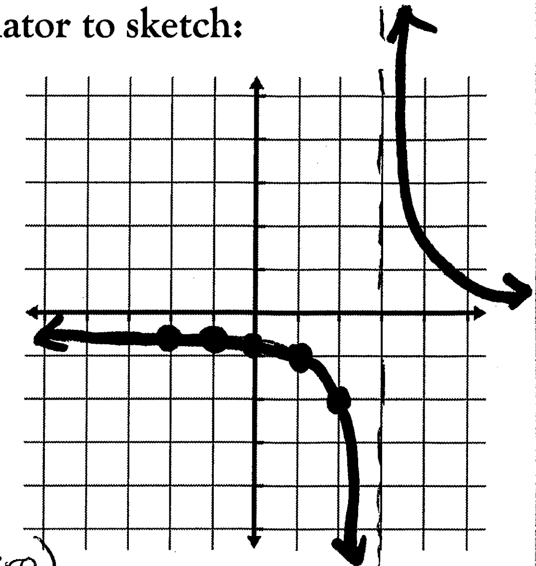
Domain: the set of all input values that yield a REAL number output value

- Domain describes the x values that give a **real** number answer for y

Fill in the table of values below then use your calculator to sketch:

$y = \frac{4}{2x-6}$

x	y
-2	$4/-10 = -2/5$
-1	$4/-8 = -1/2$
0	$4/-6 = -2/3$
1	$4/-4 = -1$
2	$4/-2 = -2$
3	$4/0 =$ undefined

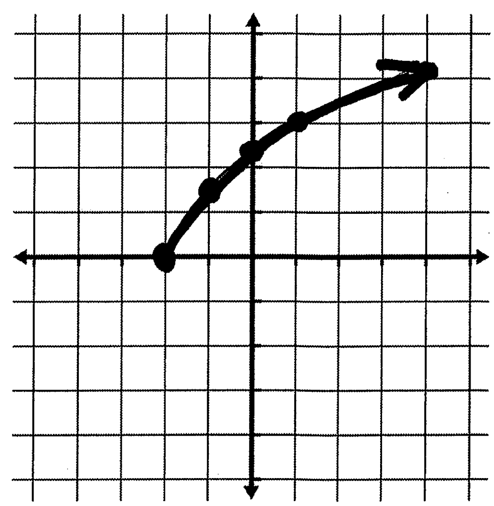


In a fraction, the denominator cannot equal 0 (zero)

Domain of $y = \frac{4}{2x-6}$ would be $2x-6 \neq 0$ $x \neq 3$ $(-\infty, 3) \cup (3, \infty)$

$y = \sqrt{3x+6}$

x	y
-4	$\sqrt{-6}$ not real
-3	$\sqrt{-3}$ not real
-2	$\sqrt{0} = 0$
-1	$\sqrt{3}$
0	$\sqrt{6}$
1	$\sqrt{9} = 3$



Under an **even** radical (square root), the radicand must be greater than or equal to zero ≥ 0

Domain of $y = \sqrt{3x+6}$ would be

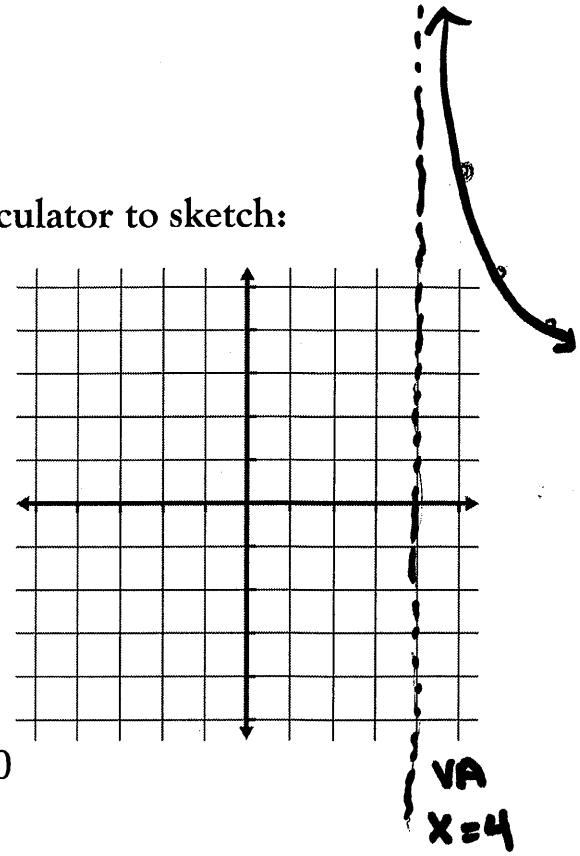
$3x+6 \geq 0$ $x \geq -2$ $[-2, \infty)$

Domain and Range Notes

Fill in the table of values below then use your calculator to sketch:

$y = \frac{8}{\sqrt{x-4}}$

x	y
2	$8/\sqrt{-2}$ not real
3	$8/\sqrt{-1}$ not real
4	$8/0$ undefined
5	$8/\sqrt{1} = 8$
6	$8/\sqrt{2} \approx 5.65$
7	$8/\sqrt{3} \approx 4.62$



For this function, there is a fraction, so $x - 4 \neq 0$

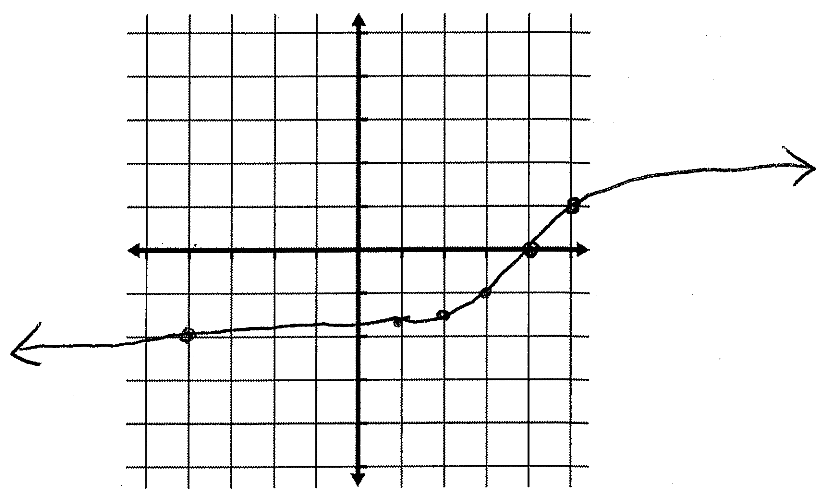
But, there is also a radical, $x - 4 \geq 0$

If we put these ideas together, then $x - 4 > 0$

Domain of $y = \frac{3}{\sqrt{x-4}}$ would be $x-4 > 0$ so $x > 4$ $(4, \infty)$

What about $y = \sqrt[3]{x-4}$

x	y
3	$\sqrt[3]{-1} = -1$
4	$\sqrt[3]{0} = 0$
5	$\sqrt[3]{1} = 1$



Domain of $y = \sqrt[3]{x-4}$

would be: All Real Numbers!

$\mathbb{R}$ $(-\infty, \infty)$