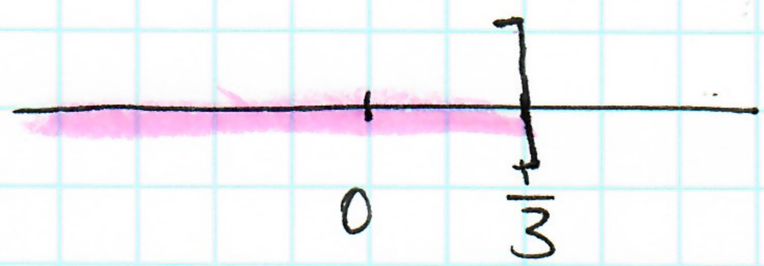
#10 domain of function in one variable is the set of all values of the variable where the function is defined.

(a) put-in the restriction $2-6x \geq 0$ because $\sqrt{\text{neg. number}}$ is undefined in the set of real numbers.

$2-6x \geq 0$

$\frac{-6x}{-6} \geq \frac{-2}{-6}$

$x \leq \frac{1}{3}$



Answer: $(-\infty, \frac{1}{3}]$

(b) when $x=0$, $\frac{1}{x}$ is undefined, hence we need to exclude 0 from the domain.

Answer: $(-\infty, 0) \cup (0, \infty)$

(c) we need to put-in two restrictions:

$x-3 \geq 0$ for the $\sqrt{x-3}$ to be defined

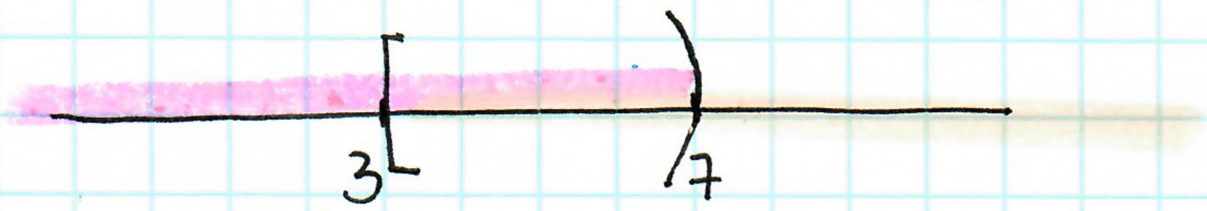
$7-x > 0$ for the $\sqrt{7-x}$ to be defined and exclude division by 0.

$x-3 \geq 0$

$x \geq 3$

$7-x > 0$

$7 > x$ or $x < 7$



Answer: $[3, 7)$