4.1 Properties of Functions

Finding Domains:

- Rational - The domain exists everywhere where the denominator does not equal zero.

1) $f(x) = \frac{5}{x-9}$ $\quad x-9 \neq 0$ $\quad x \neq 9$ $\quad$ Domain: $(-\infty, 9) \cup (9, +\infty)$

2) $f(x) = \frac{2x}{x^2-6x+5}$ $\quad x^2-6x+5 \neq 0$ $\quad (x-5)(x-1) \neq 0$ $\quad x \neq 5 \quad x \neq 1$ $\quad$ Domain: $(-\infty, 1) \cup (1, 5) \cup (5, +\infty)$

- Square Root - The domain exists everywhere where the value under the radical is ≥ 0

1) $f(x) = \sqrt{x-5}$ $\quad x-5 \geq 0$ $\quad x \geq 5$ $\quad$ Domain: $[5, +\infty)$

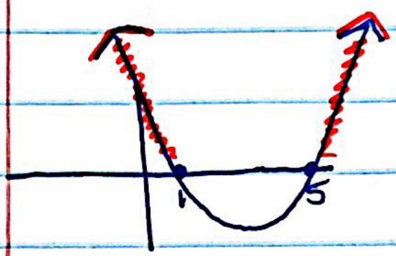
2) $f(x) = \frac{1}{\sqrt{x-7}}$ $\quad x-7 > 0$ $\quad x > 7$ $\quad$ Domain: $(7, +\infty)$

3) $f(x) = \sqrt{x^2 - 6x + 5}$

$x^2 - 6x + 5 \ge 0$

$(x-5)(x-1) \ge 0$

$x^2 - 6x + 5 = y$



Domain:

$(-\infty, 1] \cup [5, +\infty)$