What is a Rational Number?

1.18325

$\frac{18325}{100000}$

What is a Rational Function?

$$f(x) = \frac{N(x)}{D(x)} \quad D(x) \neq 0$$

$N(x)$ and $D(x)$ have to be polynomials

Domain Restrictions

1) Can't be divided by zero

2) Any even root has to be ≥ 0

3) Real Life Restrictions

Find the Domain

1) $f(x) = \frac{1}{x}$ $\quad x \neq 0$

2) $f(x) = \frac{3x-5}{x^2-4}$ $\quad x \neq -2, 2$

$x^2 - 4 \neq 0$

$\sqrt{x^2} \neq \sqrt{4}$

$x \neq \pm 2$

3) $f(x) = \frac{1}{x^2+4}$ $x = \mathbb{R}$

$x^2 + 4 \neq 0$

$\sqrt{x^2} \neq \sqrt{-4}$

$x \neq$

4) $f(x) = \frac{3x}{x^2-6x+9}$ $x \neq 3$

$x^2 - 6x + 9 \neq 0$

$(x-3)(x-3) \neq 0$

$x - 3 \neq 0$

$x \neq 3$

5) $f(x) = \dfrac{7x^2 - 15x + 1592}{|x| - 2}$ $x \neq \pm 2$

$|x| - 2 \neq 0$

$|x| \neq 2$

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

$x \neq -2$

6) $f(x) = \dfrac{10}{|x+2| - 5}$ $x \neq -7, 3$

$|x+2| - 5 \neq 0$

$|x+2| \neq 5$

$x+2 \neq 5$ $\quad -(x+2) \neq 5$

$-2 \quad -2$ $\quad -x-2 \neq 5$

$+2 \quad +2$

$x \neq 3$ $\quad -x \neq 7$

$x \neq -7$

Pg 149

#13-22 all

only do domain