

Graphing Rational Functions

Sketch each of the following graphs. State the domain and range.

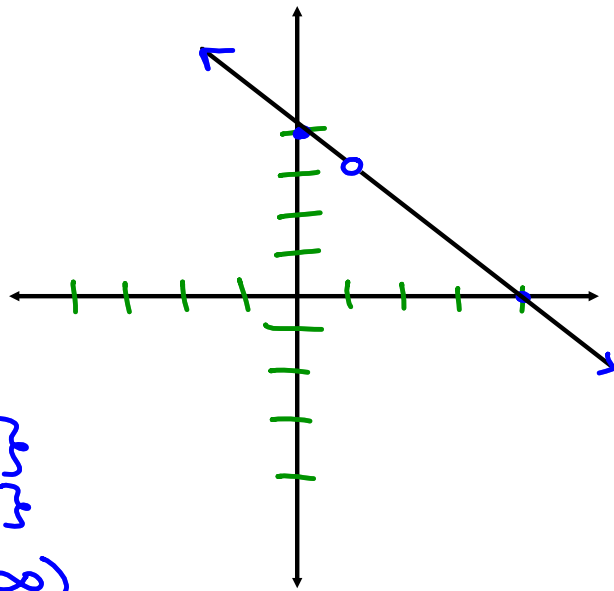
$$y = \frac{x^2 - 5x + 4}{1 - x}$$

$$y = \frac{(x-1)(x-4)}{-(x-1)}$$

$$y = -x + 4, \quad x \neq 1$$

P.o.d. $(1, 3)$
 No VA
 No HA

D: $\{x \mid x \in \mathbb{R}, x \neq 1\}$
 or R: $\{y \mid y \in \mathbb{R}, y \neq 3\}$
 D: $(-\infty, 1) \cup (1, \infty)$
 R: $(-\infty, 3) \cup (3, \infty)$



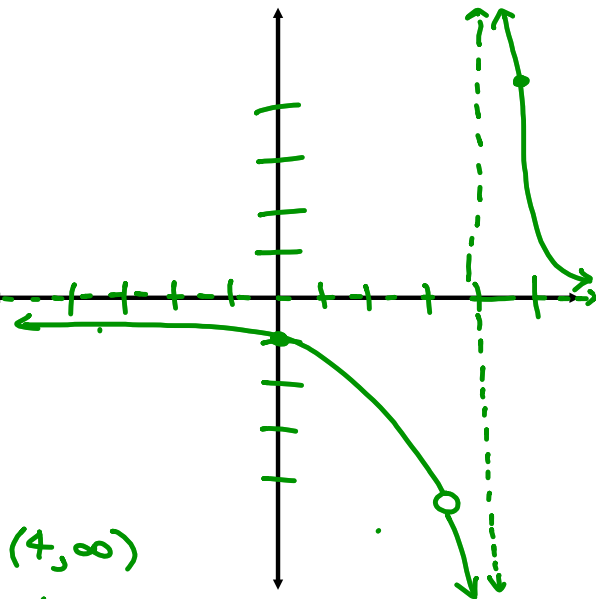
$$y = \frac{4x - 12}{x^2 - 7x + 12}$$

$$= \frac{4(x-3)}{(x-3)(x-4)}$$

$$= \frac{4}{x-4}, \quad x \neq 3, 4$$

P.o.d. $(3, -4)$
 VA $x = 4$
 HA $y = 0$

D: $(-\infty, 3) \cup (3, 4) \cup (4, \infty)$
 R: $(-\infty, -4) \cup (-4, 0) \cup (0, \infty)$



$$y = \frac{3x^2}{x^2 - 4}$$

$$= \frac{3x^2}{(x-2)(x+2)}$$

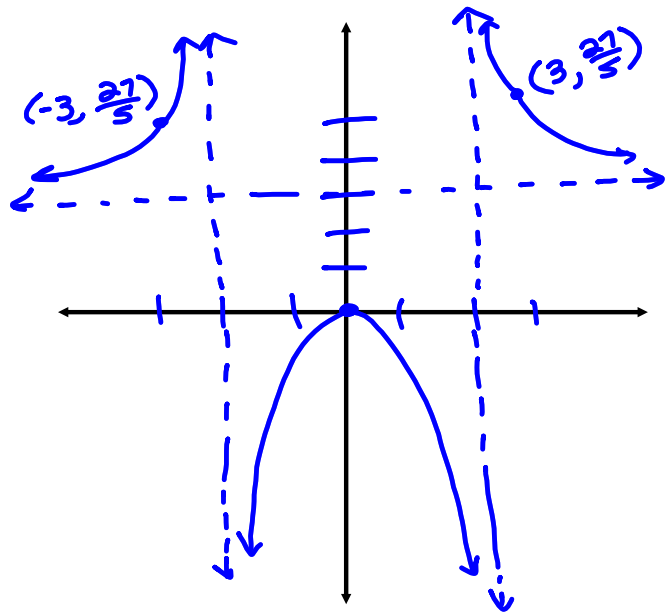
$x \neq \pm 2$

VA $x = \pm 2$

HA $y = 3$

$$y = \frac{3(-3)^2}{(-3)^2 - 4}$$

$$= \frac{27}{5}$$



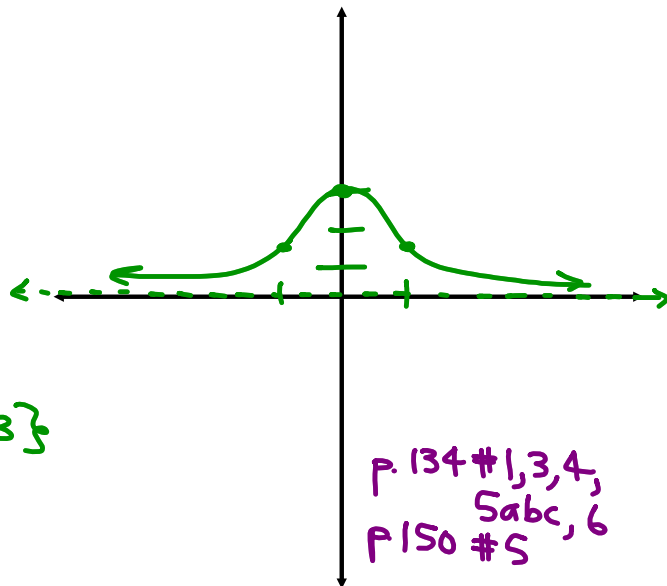
$$y = \frac{3}{x^2 + 1}$$

NO NPVS

HA $y = 0$

D: $\{x \mid x \in \mathbb{R}\}$

R: $\{y \mid 0 < y \leq 3\}$



P. 134 #1, 3, 4,
5abc, 6
P. 150 #5