

1. $y = \sqrt{x-4}$
function

2. $y = x^2 + 3$
not a function:

3. $x = 2y^2$
not a function

for $x=1, y=4$ or -2

for $x=2, y=1$ or -1

4. $x = 12 - y$
 $y = -x + 12$
function

5. function

6. Not a function

7. not a function

8. functions

9. $f(x) = x^2 + 4$
no restrictions on x
domain = $(-\infty, \infty)$

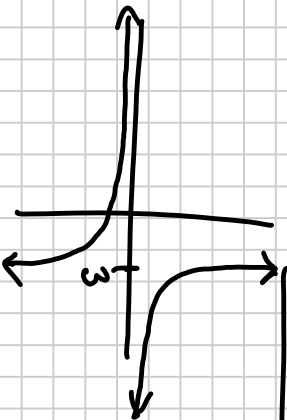
$$10. h(x) = \frac{5}{x-3}$$

denom $\neq 0$

$$x-3=0$$

$$x \neq 3$$

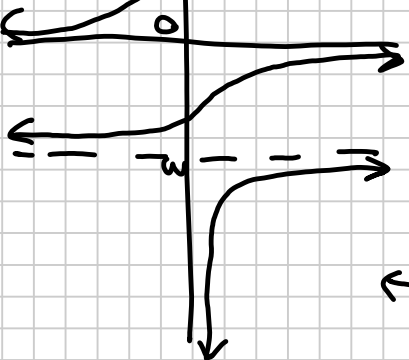
domain: $(-\infty, 3) \cup (3, \infty)$



$$12. f(x) = \frac{1}{x} + \frac{5}{x-3}$$

$$x \neq 0 \quad x \neq 3$$

domain: $(-\infty, 0) \cup (0, 3) \cup (3, \infty)$



$$11. f(x) = \frac{3x-1}{(x+3)(x-1)}$$

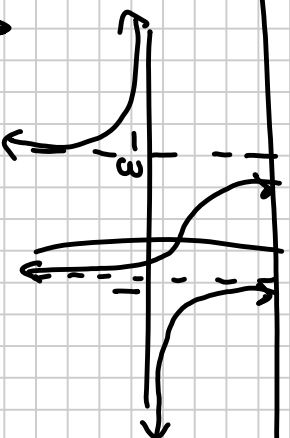
$$\frac{-1}{3(-1)} = \frac{-1}{-3}$$

denom $\neq 0$

$$x+3=0 \quad x-1=0$$

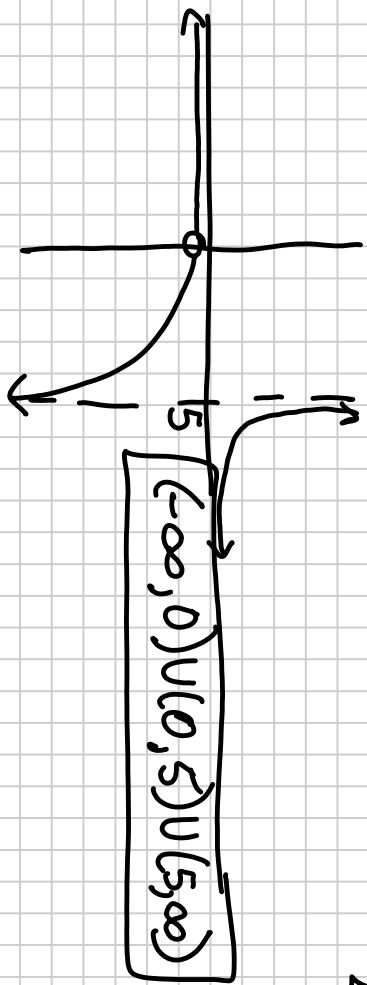
$$x \neq -3 \quad x \neq 1$$

domain: $(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$



$$13. g(x) = \frac{x}{x^2 - 5x} = \frac{x}{x(x-5)}$$

$$x \neq 0, x \neq 5$$



$$14. h(x) = \frac{\sqrt{4-x^2}}{x-3}$$

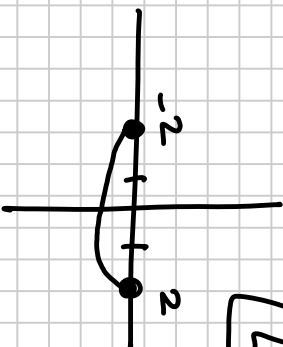
under radical ≥ 0

$$4 - x^2 \geq 0$$

$$-x^2 \geq -4$$

$$x^2 \leq 4$$

$$-2 \leq x \leq 2$$



denom $\neq 0$

$$x - 3 = 0$$

$$x \neq 3$$

(out of domain anyway)

$$[-2, 2]$$

$$15. h(x) = \frac{\sqrt{4-x}}{(x+1)(x^2+1)}$$

$$4 - x \geq 0$$

$$-x \geq -4$$

$$x \leq 4$$

$$x+1 = 0$$

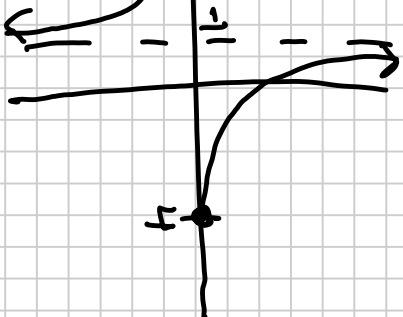
$$x \neq -1$$

$$x^2+1 = 0$$

$$x^2 = -1$$

not possible in \mathbb{R}

$$(-\infty, -1) \cup (-1, 4]$$



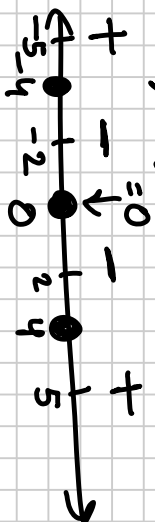
$$16. f(x) = \sqrt{x^4 - 16x^2}$$

$$x^4 - 16x^2 \geq 0$$

$$x^2(x^2 - 16) \geq 0$$

$$x^2(x+4)(x-4) \geq 0$$

$$x = 0, -4, 4$$



$$(-\infty, -4] \cup [0, 0] \cup [4, \infty)$$

