13. $f(x) = 2x - 5$ line

D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

14. $g(x) = 6$ (horizontal line)

D: $(-\infty, \infty)$

R: $[6]$

15. $h(x) = (x-3)^2 + 2$

parabola with vertex $(3, 2)$ opening up

D: $(-\infty, \infty)$

R: $[2, \infty)$

16. $V(x) = x^2 + 6x$ parabola opening up.

$V(x) = x^2 + 6x + 9 - 9$

$V(x) = (x+3)^2 - 9$ vertex $(-3, -9)$

D: $(-\infty, \infty)$

R: $[-9, \infty)$

17. $y = x^3 - 9x^2 + 4x + 7$

polynomial degree 3

starts quad III

and quad I

D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

19. $f(x) = \sqrt{x+7}$

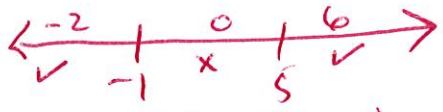
D: $[-7, \infty)$

R: $[0, \infty)$

20. $g(x) = \sqrt{x^2 - 4x - 5}$

$x^2 - 4x - 5 \geq 0$

$(x-5)(x+1) \geq 0$



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

R: $[0, \infty)$

21. $h(x) = \sqrt[3]{x+4}$

D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

27) $f(x) = 2^x$ exponential growth

D: $(-\infty, \infty)$

R: $(0, \infty)$

31. $g(x) = \log_2 (x-4)$

can't take log of zero or negative number

$\therefore (x-4) > 0$

$x > 4$

D: $(4, \infty)$

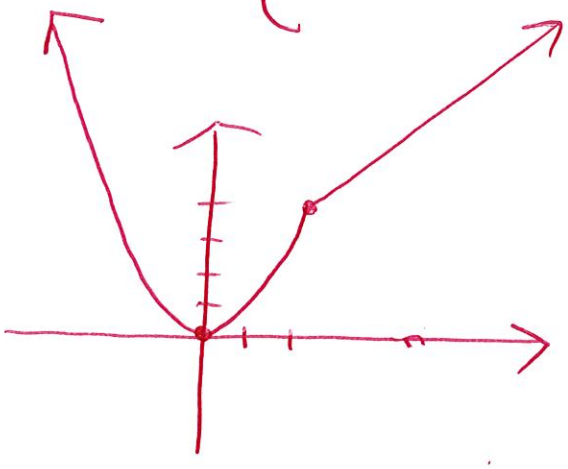
R: $(-\infty, \infty)$

33. $y = |2x-5|$

D: $(-\infty, \infty)$

R: $[0, \infty)$

35. $f(x) = \begin{cases} x^2, & (-\infty, 2] \\ x+2, & (2, \infty) \end{cases}$

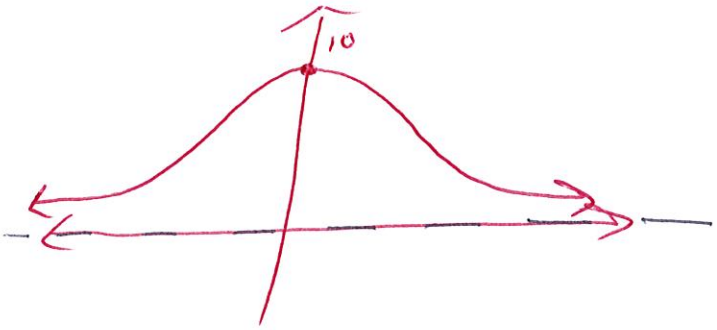


D: $(-\infty, \infty)$

R: $[0, \infty)$

37. $f(x) = \dfrac{10}{x^2+1}$ no vertical asymptotes
horizontal asymptote $y=0$

D: $(-\infty, \infty)$
R: $(0, 10]$

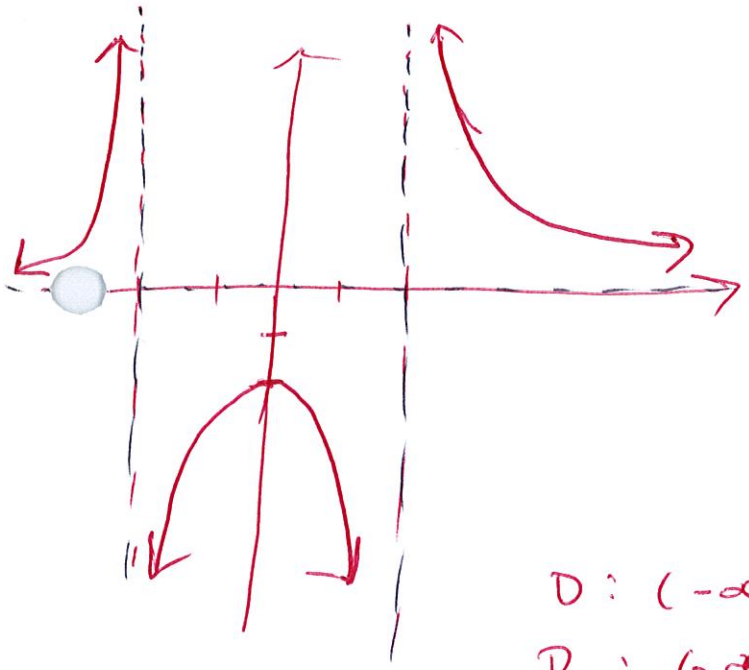


38. $g(x) = \dfrac{8}{x^2-4} = \dfrac{8}{(x-2)(x+2)}$

VA $x=2$ $x=-2$
HA $y=0$
no x int
y int $x=-2$

sign analysis

$+ + + \quad + + \quad + + \; 8$ (N)
$- - - \quad -\infty + + \; x-2$ (D)
$- - - \quad \infty + + + \; x+2$ (D)



D: $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$
R: $(-\infty, -2] \cup (0, \infty)$

42. $y = \dfrac{x+1}{x-1}$ VA $x=1$ HA $y=1$ x int $x=-1$ y int $y=-1$