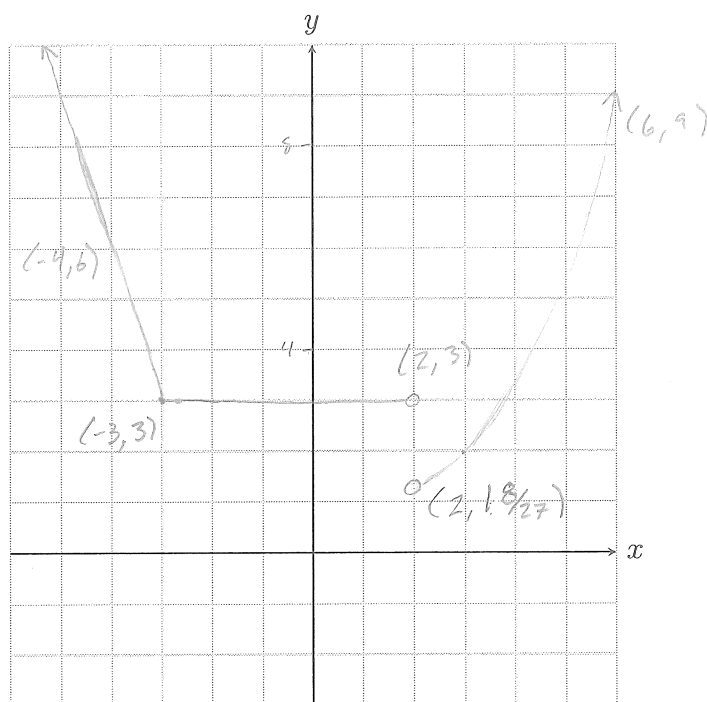


1. A function f defined as

$$f(x) = \begin{cases} -3x - 6 & \text{if } x \leq -3 \\ 3 & \text{if } -3 < x < 2 \\ \left(\frac{1}{3}x\right)^3 + 1 & \text{if } x \geq 2 \end{cases}$$

a. Graph $y = f(x)$.



b. Find $f(-3)$, $f(0)$, and $f(4)$.

$$f(-3) = 3$$

$$f(0) = 3$$

$$f(4) = \left(\frac{4}{3}\right)^3 + 1 = \frac{64}{27} + \frac{27}{27} = \frac{91}{27}$$

c. Locate any intercepts.

$$y\text{-int: } (0, 3)$$

d. Determine the domain and range of f .

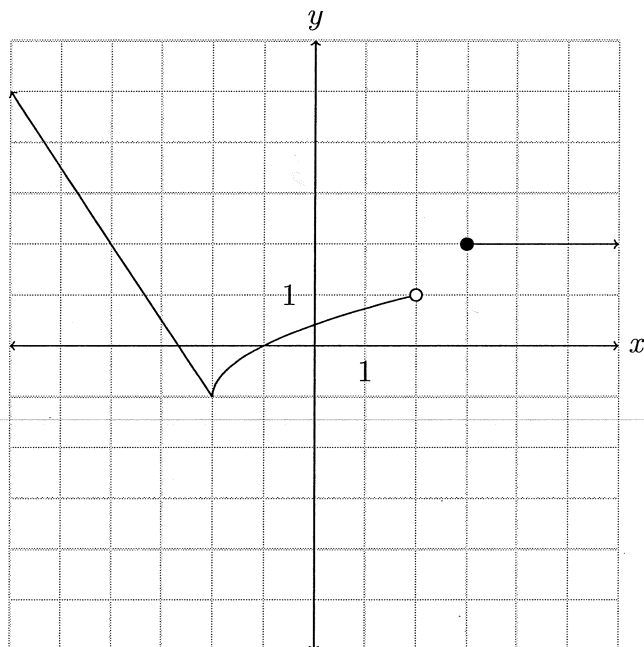
$$D = (-\infty, 2) \cup (2, \infty)$$

$$R = \left(1\frac{8}{27}, \infty\right)$$

e. Is f continuous on its domain?

Yes! The only discontinuity is at $x=2$ which is NOT in the domain.

2. The graph of a piecewise-defined function is given. Write a definition for the function.



$$f(x) = \begin{cases} -\frac{3}{2}x - 5 & x \leq -2 \\ \sqrt{x+2} - 1 & -2 < x < 2 \\ 2 & x \geq 3 \end{cases}$$