ILLAWARRA TUTORING

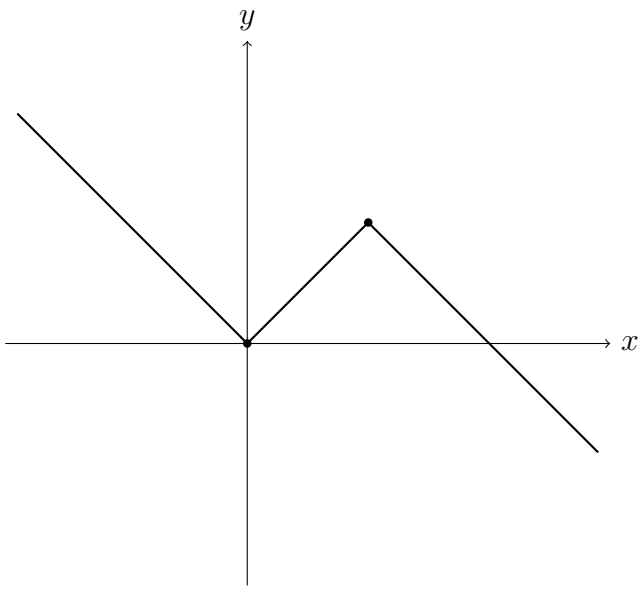
In this worksheet you will determine the domain and range of functions from equations or graphs, ensuring you understand all possible inputs and outputs.

Easy Questions

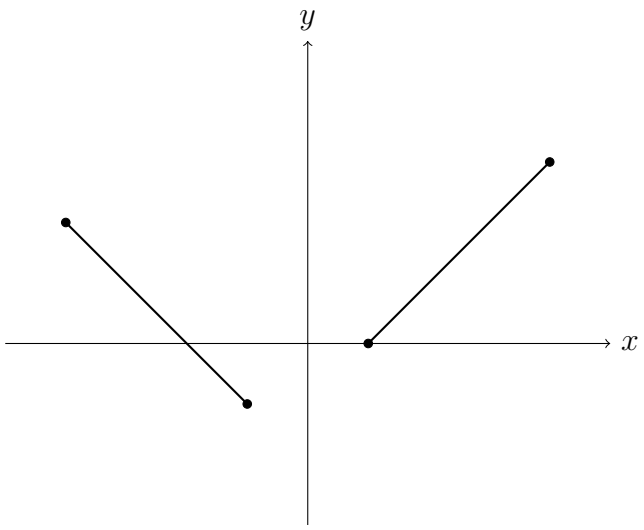
1. Determine the domain and range of the function $f(x) = 3x + 1$.
2. Determine the domain and range of the function $f(x) = -4$.
3. Determine the domain and range of the function $f(x) = \sqrt{x - 1}$.
4. Determine the domain and range of the function $f(x) = \dfrac{1}{x - 3}$.
5. Determine the domain and range of the function $f(x) = |x - 2|$.

Intermediate Questions

6. The function $f(x) = \begin{cases} x^2 & \text{if } x \leq 0, \\ 2x + 1 & \text{if } x > 0, \end{cases}$ is defined piecewise. Determine its domain and range.
7. Determine the domain and range of $f(x) = \sqrt{4 - x}$.
8. Determine the domain and range of $f(x) = \dfrac{1}{\sqrt{x + 2}}$.
9. Determine the domain and range of $f(x) = \dfrac{x^2}{x^2 + 1}$.
10. Determine the domain and range of $f(x) = (x - 1)^2$.
11. Determine the domain and range of $f(x) = \dfrac{2}{x^2 + 1}$.
12. The function $f(x) = \begin{cases} -x & \text{if } x < 0, \\ x & \text{if } 0 \leq x \leq 2, \\ 4 - x & \text{if } x > 2, \end{cases}$ is shown in the graph below. Determine its domain and range.



13. Determine the domain and range of $f(x) = \sqrt{9 - x^2}$.
14. Determine the domain and range of $f(x) = \dfrac{1}{x - 2} + 3$.
15. Determine the domain and range of $f(x) = \dfrac{x + 1}{x + 2}$.
16. Determine the domain and range of $f(x) = \sqrt[3]{x - 3}$.
17. Determine the domain and range of $f(x) = \dfrac{|x|}{x^2 + 1}$.
18. Determine the domain and range of $f(x) = \sqrt{x} + \sqrt{1 - x}$.
19. Determine the domain and range of $f(x) = |x + 2| + 1$.
20. The function f is given by the graph below. Determine its domain and range.



Hard Questions

21. Determine the domain and range of $f(x) = \sqrt{4-(x-2)^2}$.
22. Determine the domain and range of $f(x) = \dfrac{x^2-4}{x-2}$.
23. Determine the domain and range of $f(x) = \sqrt{(x+1)(3-x)}$.
24. Determine the domain and range of $f(x) = \dfrac{(x-3)^2}{x^2}$, and explain why the range is $[0, \infty)$.
25. Determine the domain and range of $f(x) = \sqrt{x^2-4x+3}$.
26. Determine the domain and range of $f(x) = \sqrt{4x-4-x^2}$.
27. Determine the domain and range of $f(x) = \sqrt{x+4} - \sqrt{x}$.
28. Determine the domain and range of $f(x) = \sqrt{2-x} + \sqrt{x+1}$.
29. Determine the domain and range of $f(x) = |x+2| - |x-1|$.
30. The function f is defined by the graph below. Determine its domain and range.