

Exercise 51

Find an expression for the function whose graph is the given curve.

The line segment joining the points $(1, -3)$ and $(5, 7)$

Solution

The equation for a line is

$$y = mx + b.$$

Because we know two points, we can determine the two unknowns, m and b .

$$\begin{aligned} -3 &= m(1) + b \\ 7 &= m(5) + b \end{aligned}$$

Solving this system of equations yields

$$m = \frac{5}{2} \quad \text{and} \quad b = -\frac{11}{2}.$$

Therefore, the line going through the points, $(1, -3)$ and $(5, 7)$, is

$$y = \frac{5}{2}x - \frac{11}{2}.$$

Restricting x to be between 1 and 5 results in the desired line segment.