Exercise 3

For the following exercises, points $P(1, 2)$ and $Q(x, y)$ are on the graph of the function $f(x) = x^2 + 1$.

Use the value in the preceding exercise to find the equation of the tangent line at point P. Graph $f(x)$ and the tangent line.

Solution

The slope of the tangent line to f at $x = 1$ is 2, and this line passes through $(1, 2)$.

$$y - 2 = 2(x - 1)$$

$$y - 2 = 2x - 2$$

$$y = 2x$$

Below is the graph of $y = f(x)$ and the tangent line at $x = 1$.