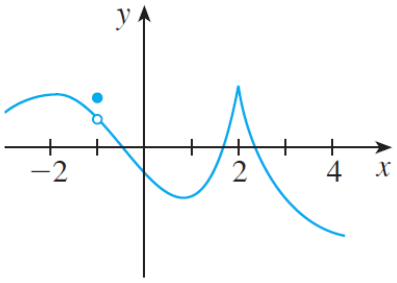

Exercise 1 Find the derivative of the function using the definition of derivative. State the domain of the function and the domain of its derivative.

(a) $f(x) = \dfrac{1}{\sqrt{x}}$

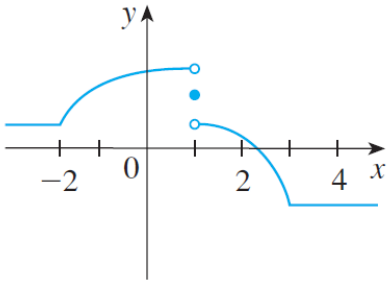
(b) $g(t) = \dfrac{t^2 - 1}{2t - 3}$

(c) $h(x) = x^{3/2}$

Exercise 2 The graph of f is given. State, with reasons, the numbers at which f is not differentiable.

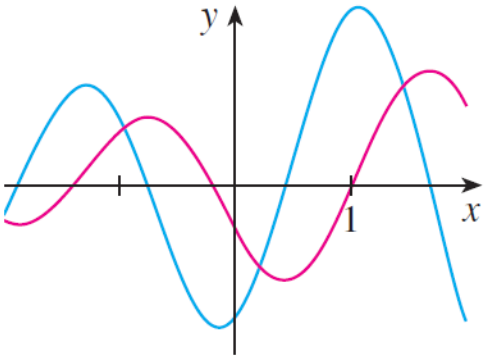


Exercise 3 The graph of g is given. State, with reasons, the numbers at which g is not differentiable.



Exercise 4 Sketch the graph of the function $h(x) = x + |x|$. For what values of x is h differentiable? Find a formula for h'.

Exercise 5 The graphs of a function f and its derivative f' are shown. Which is bigger, $f'(-1)$ or $f''(1)$?



Exercise 6 (a) If $g(x) = x^{2/3}$, show that $g'(0)$ does not exist.

(b) If $a \neq 0$, find $g'(a)$.

(c) Show that $y = x^{2/3}$ has a vertical tangent line at $(0, 0)$.