1. A continuous function f on $(-\infty, \infty)$ satisfies the following conditions:

❶ $f(0) = 6\,,\; f(3) = 0$

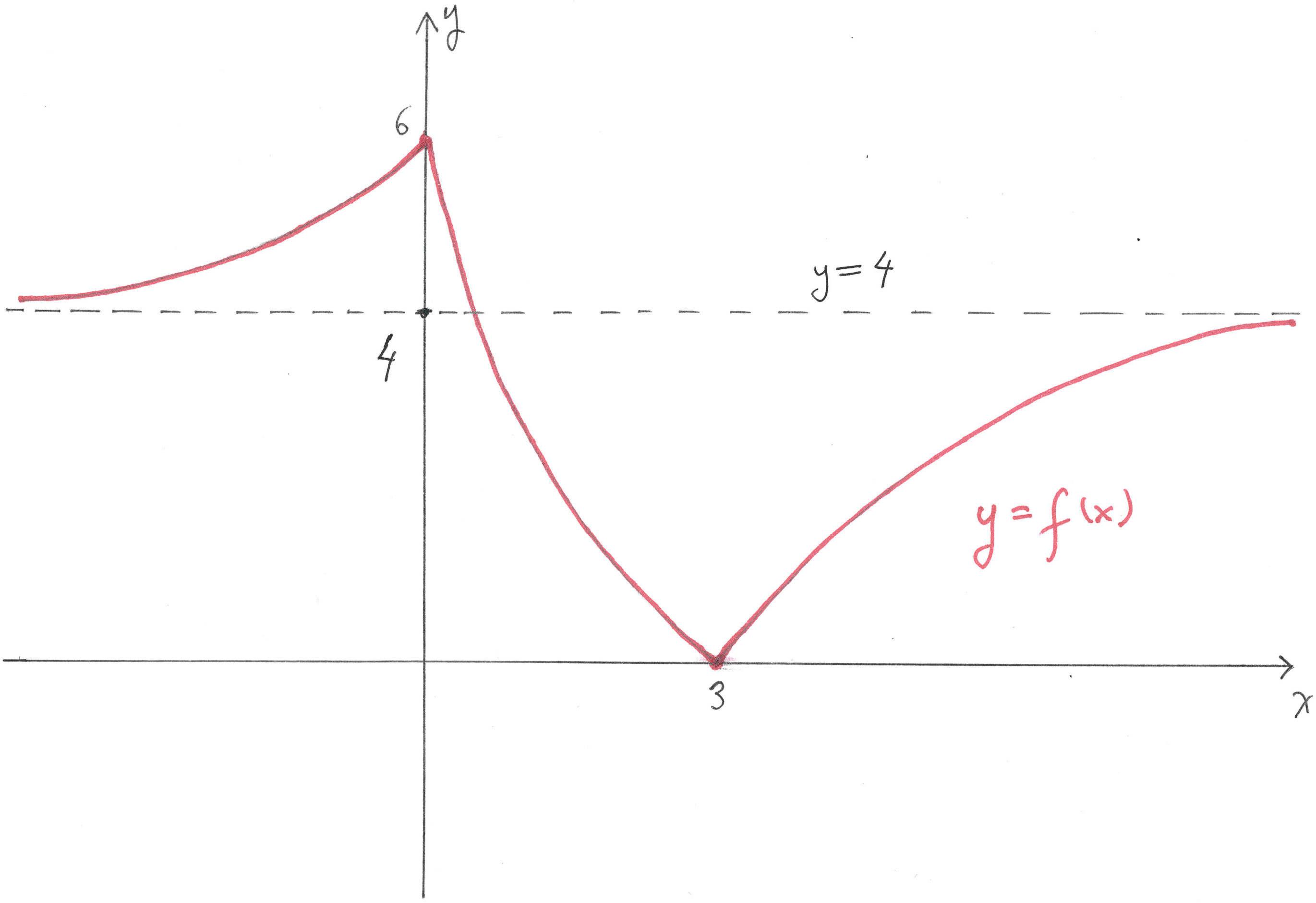
❷ $f'(x) > 0$ for $x < 0$ and for $3 < x$; $f'(x) < 0$ for $0 < x < 3$

❸ $f''(x) > 0$ for $x < 0$ and for $0 < x < 3$; $f''(x) < 0$ for $3 < x$

❹ $\lim_{x\to-\infty} f(x) = 4\,,\; \lim_{x\to\infty} f(x) = 4$

❺ $\lim_{x\to 0^-} f'(x) = 1\,,\; \lim_{x\to 0^+} f'(x) = -5\,;\; \lim_{x\to 3^-} f'(x) = -4/5\,,\; \lim_{x\to 3^+} f'(x) = 4/5$

a. Sketch the graph of $y = f(x)$ making sure that all important features are clearly shown.



b. Fill in the boxes to make the following a true statement. No explanation is required.

The function $f(x) = \dfrac{|x-a|}{b|x|+c}$ satisfies the conditions ❶-❺ if a, b and c are chosen as

$a = \boxed{3}$, $b = \boxed{\frac{1}{4}}$ and $c = \boxed{\frac{1}{2}}$.