

3. Consider the function

$$f(x) = \frac{\sqrt{3-x^2}}{(2x-5)\log x}.$$

Determine the natural domain  $D$  of  $f$ , i.e. the set of all real numbers for which its defining formula makes sense. For full marks write  $D$  as a union of intervals (see Definition 1.2).

5. Define  $f : \mathbb{R} \rightarrow \mathbb{R}$  by

$$f(x) = \begin{cases} -3\sqrt{2-x} & x < 1 \\ 7 & x = 1 \\ \frac{x^2 - 5x + 4}{x - 1} & x > 1. \end{cases}$$

Determine whether or not  $\lim_{x \rightarrow 1} f(x)$  exists. If  $f$  continuous at 1? Explain your answer.