

Your Name:

Duration of the Quiz is 20 minutes. There are three problems, worth 20 points. Show all your work for full credit. Books, notes etc. are prohibited. Calculators are NOT permitted.

1. Let

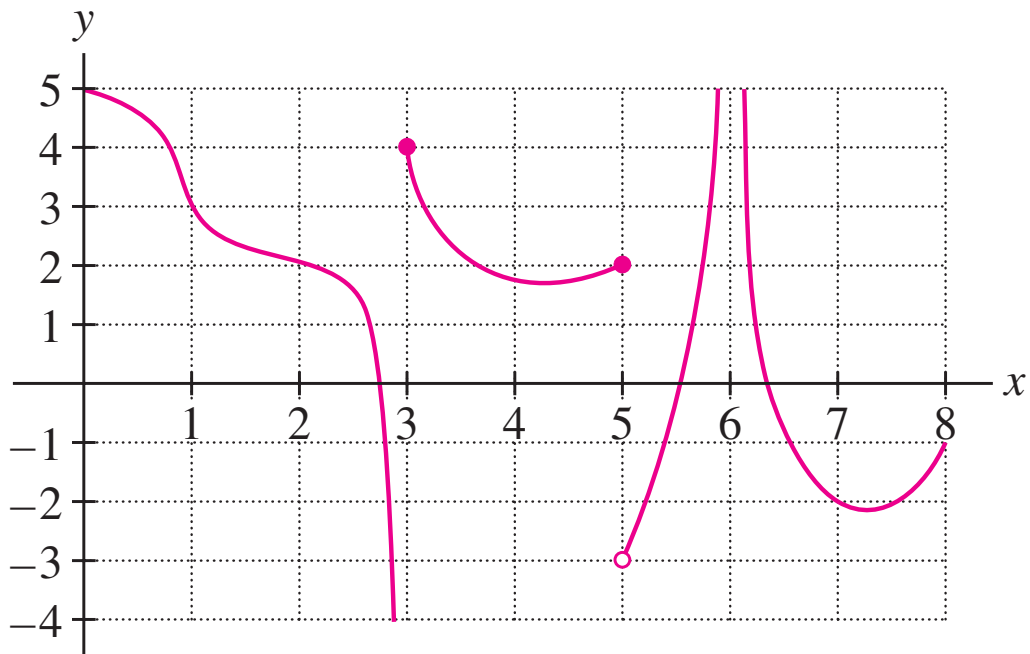
$$f(x) = \begin{cases} 2^x & \text{if } x \leq 1, \\ 3 - x & \text{if } 1 < x \leq 4, \\ \sqrt{x} & \text{if } x > 4. \end{cases}$$

Sketch the graph of the function and use it to determine the limits  $\lim_{x \rightarrow 1} f(x)$  and  $\lim_{x \rightarrow 4} f(x)$  if they exist. If they do not, explain why.

2. Determine the infinite limit.

$$\lim_{x \rightarrow \frac{\pi}{2}^-} \ln(\cos x)$$

3. For the function  $f$  whose graph is shown, state the following.



(a)  $\lim_{x \rightarrow 3^-} f(x)$

(b)  $\lim_{x \rightarrow 3^+} f(x)$

(c)  $\lim_{x \rightarrow 5^-} f(x)$

(d)  $\lim_{x \rightarrow 5^+} f(x)$

(e)  $\lim_{x \rightarrow 6^+} f(x)$

(f) The equations of the vertical asymptotes.