

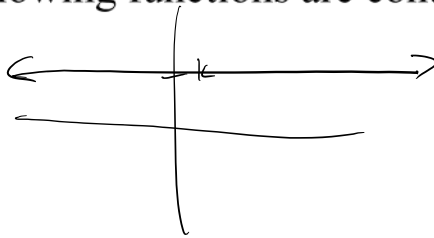


Calculus AB, section 2.4

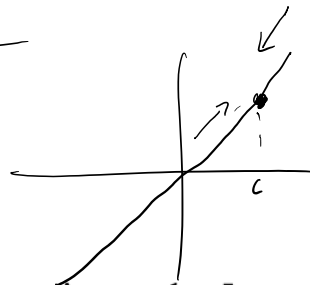
Example 1

Show that the following functions are continuous:

a. $f(x) = k$



b. $g(x) = x$



[the limit exists and is equal to the function value]

Example 2

Discuss the continuity of the function $F(x)$ defined by

$$F(x) = \begin{cases} x & \text{for } x < 1 \\ 3 & \text{for } 1 \leq x \leq 3 \\ x & \text{for } x > 3 \end{cases} \quad \text{[graph below]}$$

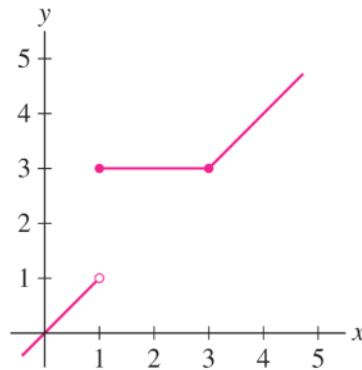


FIGURE 7 Piecewise-defined function $F(x)$ in Example 2.

Example 3

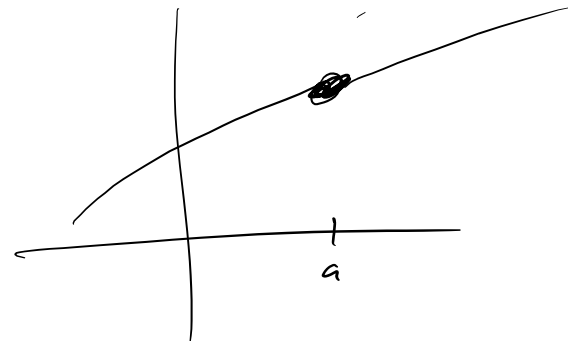
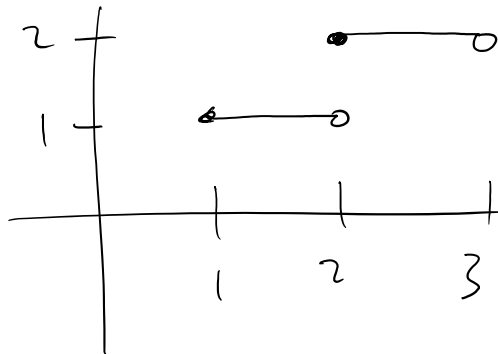
Evaluate:

$$\text{a. } \lim_{y \rightarrow \frac{\pi}{3}} \sin y = \sin \frac{\pi}{3} = \frac{\sqrt{3}}{2}$$

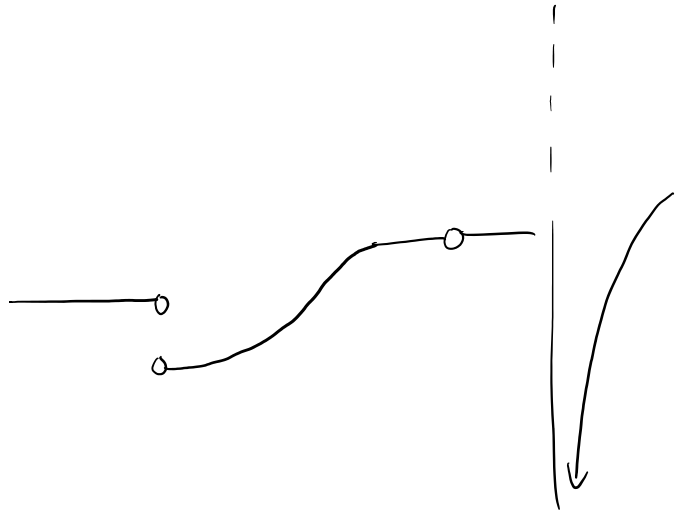
$$\text{b. } \lim_{x \rightarrow -1} \frac{3^x}{\sqrt{x+5}} = \frac{3^{-1}}{\sqrt{4}} = \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$$

Example 4

Can substitution be used to evaluate $\lim_{x \rightarrow 2} [x]$, where $[x]$ is the greatest integer function?



Sketching graphs with given limits - practice



91: 5, 7, 8, 17, 19, 21, 53-55

