

## Limits and Continuity Practice

1.  $\lim_{x \rightarrow \frac{\pi}{6}} \sec^2 x =$

(A)  $\frac{3}{4}$

(B)  $\frac{\sqrt{3}}{2}$

(C)  $\frac{4}{3}$

(D)  $\frac{2\sqrt{3}}{3}$

2.  $\lim_{x \rightarrow 0} \frac{\sin 3x}{\sin 2x} =$

(A)  $\frac{2}{3}$

(B) 1

(C)  $\frac{3}{2}$

(D) nonexistent

3.  $\lim_{x \rightarrow 0} \frac{\sqrt{4+x}-2}{x} =$

(A)  $\frac{1}{8}$

(B)  $\frac{1}{4}$

(C)  $\frac{1}{2}$

(D) nonexistent

4.  $\lim_{x \rightarrow 0} \frac{\tan 3x}{x} =$

(A) 0

(B)  $\frac{1}{3}$

(C) 1

(D) 3

5. If  $f(x) = \begin{cases} x^2 + 3, & x \neq 1 \\ 1, & x = 1 \end{cases}$ , then  $\lim_{x \rightarrow 1} f(x) =$

(A) 1

(B) 2

(C) 3

(D) 4

6. Let  $f$  be a function defined by  $f(x) = \begin{cases} \frac{x^2 - a^2}{x - a}, & \text{if } x \neq a \\ 4, & \text{if } x = a \end{cases}$ . If  $f$  is continuous for all real numbers  $x$ , what is the value of  $a$ ?

(A)  $\frac{1}{2}$

(B) 0

(C) 1

(D) 2

7. If  $f(x) = \begin{cases} \frac{\sqrt{3x-1}-\sqrt{2x}}{x-1}, & \text{for } x \neq 1 \\ a, & \text{for } x = 1 \end{cases}$ , and if  $f$  is continuous at  $x = 1$ , then  $a =$

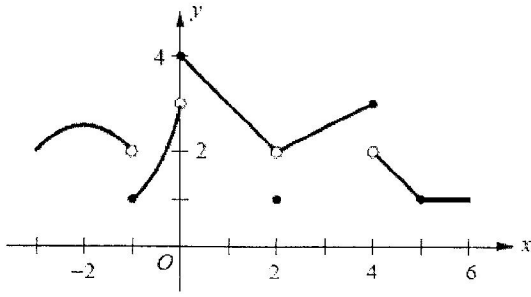
(A)  $\frac{1}{4}$

(B)  $\frac{\sqrt{2}}{4}$

(C)  $\sqrt{2}$

(D) 2

8.



The graph of a function  $f$  is shown above. If  $\lim_{x \rightarrow a} f(x)$  exists and  $f$  is not continuous at  $x = a$ , then  $a =$

- (A) -1                      (B) 0                      (C) 2                      (D) 4

9.

$$\lim_{h \rightarrow 0} \frac{\sqrt[3]{8+h} - 2}{h} =$$

- (A)  $\frac{1}{12}$                       (B)  $\frac{1}{4}$                       (C)  $\frac{\sqrt[3]{2}}{2}$                       (D)  $\sqrt[3]{2}$                       (E) 2