

Stewart - Calculus 8e Chapter 1 Form A

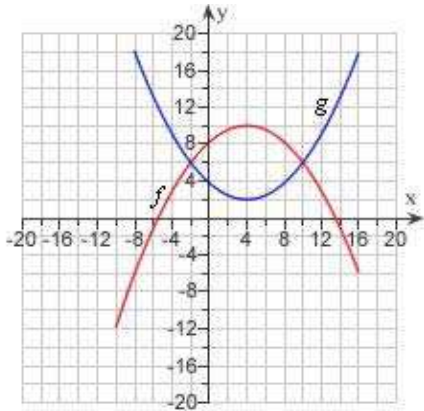
1. Find the domain of the function.

$$f(x) = \frac{5}{4x - 1}$$

2. Determine whether f is even, odd, or neither.

$$f(x) = \frac{8x^2}{x^4 + 1}$$

3. The graphs of $f(x)$ and $g(x)$ are given.
 - a) For what values of x is $f(x) = g(x)$?
 - b) Find the values of $f(-2)$ and $g(4)$.



4. It makes sense that the larger the area of a region, the larger the number of species that inhabit the region. Many ecologists have modeled the species-area relation with a power function and, in particular, the number of species S of bats living in caves in central Mexico has been related to the surface area A measured in m^2 of the caves by the equation

$$S = 0.7A^{0.3}$$

- (a) The cave called mission impossible near puebla, mexico, has surface area of $A = 90m^2$.
How many species of bats would expect to find in that cave?
- (b) If you discover that 5 species of bats live in cave estimate the area of the cave.

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5. Express the function in the form of $f \circ g$.

$$v(t) = \sec(t^4) \tan(t^4)$$

6. The position of a car is given by the values in the following table.

t (seconds)	0	1	2	3	4	5
s (feet)	0	16	35	71	112	179

Estimate the instantaneous velocity when $t = 2$ by averaging the velocities for the periods $[1, 2]$ and $[2, 3]$.

7. Consider the following function.

$$f(x) = \begin{cases} 3-x & x < -1 \\ x & -1 \leq x < 3 \\ (x-3)^2 & x \geq 3 \end{cases}$$

Determine the values of a for which $\lim_{x \rightarrow a} f(x)$ exists.

8. Find the limit.

$$\lim_{x \rightarrow 0^+} \tan^{-1}\left(\frac{2}{x}\right)$$

9. Evaluate the limit.

$$\lim_{x \rightarrow 0} \frac{(6+x)^{-1} - 6^{-1}}{x}$$

10. Find the limit.

$$\lim_{x \rightarrow \frac{10}{x}} \tan^{-1}\left(\frac{5}{x}\right)$$

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11. Evaluate the limit.

$$\lim_{x \rightarrow 3} \left(\frac{x^3 - 5}{x^2 - 6} \right)$$

12. Evaluate the limit.

$$\lim_{x \rightarrow 9} \frac{3 - \sqrt{x}}{x - 9}$$

13. Evaluate the limit.

$$\lim_{x \rightarrow 0} \frac{3 - \sqrt{3 - x^2}}{x}$$

14. Find a number δ such that if $|x - 2| < \delta$, then $|4x - 8| < \varepsilon$, where $\varepsilon = 0.1$.

15. Find the point at which the given function is discontinuous.

$$f(x) = \begin{cases} \frac{1}{x-7}, & x \neq 7 \\ 7, & x = 7 \end{cases}$$

16. Write an equation that expresses the fact that a function f is continuous at the number 4.

17. Find a function g that agrees with f for $x \neq 25$ and is continuous on \mathbb{R} .

$$f(x) = \frac{5 - \sqrt{x}}{25 - x}$$

18. Let $f(x) = x^2 - 18x + 75$ and $g(x) = \sqrt{x+7}$. Find $(f \circ g)(74)(g \circ g)(74)$.

19. Find the limit $\lim_{x \rightarrow 0^+} \frac{9 + \sqrt{x}}{\sqrt{x+16}}$.

20. Find the numbers, if any, where the function $f(x) = \frac{x-3}{x^2-9}$ is discontinuous.