Calculus

1.12 Confirming Continuity Over an Interval

Notes

Write your questions and thoughts here!

Finding the Domain

Three scenarios to watch for when looking for a **restriction** on the domain.

1. $f(x) = \dfrac{x-5}{x+1}$

2. $f(x) = \sqrt{7x+3}$

3. $f(x) = \ln(2x+1)$

Find the domain of each function.

1. $f(x) = \dfrac{x^2 - x}{x}$

2. $f(x) = \dfrac{3x\sqrt{x+5}}{x}$

3. $h(x) = \dfrac{5}{2-\sqrt{x}}$

4. $\ln\left(\dfrac{x}{x-4}\right)$

5. Where is the function continuous?

$$f(x) = \begin{cases} x^2 - 2x - \frac{1}{7}, & x \le 0 \\ \frac{3}{x-7}, & 0 < x \le 3 \\ \frac{7x-15}{4x-20}, & x > 3 \end{cases}$$

1.12 Confirming Continuity Over an Interval

Calculus

Practice

Find the domain of each function.

1. $g(x) = \sqrt{12 - 2x}$

2. $f(x) = \frac{x-7}{x^2-9x+14}$

3. $f(x) = \ln(2x + 5)$

4. $h(x) = \frac{5-x}{5-\sqrt{x}}$

5. $h(t) = \frac{\sqrt{t-1}}{t^2-2t-48}$

6. $h(x) = \frac{5-x}{\sqrt{5-x}}$

7. $h(x) = \ln\left(\frac{x}{x-10}\right)$

8. $w(t) = \frac{t^2-5}{2}$

9. $h(x) = \frac{\sqrt{x-5}}{x-3}$

10. $f(x) = \frac{x+8}{x^2+8x}$

11. $g(x) = \ln\left(\sqrt{x - 7}\right)$

12. $g(t) = \sqrt{3 - 5t}$

13. Let f be the function given below. On which of the following intervals is f continuous?

$$f(x) = \begin{cases} 3^x, & x \leq -1 \\ \frac{2x+3}{x+4}, & -1 < x \leq 0 \\ x^2 + 2x, & 0 < x < 4 \\ \tan(x) & x \geq 4 \end{cases}$$

(A) $(-5, 0)$ (B) $(-0.5, 3)$ (C) $(3, 5)$ (D) $(5, \infty)$

---

14. Which of the following functions is not continuous on the interval $-\infty < x < \infty$?

(A) $f(x) = \cos(x)$

(B) $g(x) = \frac{1}{1+2^{-x}}$

(C) $h(x) = \frac{1}{x^6+x^4+x-2}$

(D) $v(x) = x^6 + x^4 + x - 2$

---

15. Which of the following functions are continuous on the interval $1 < x < 6$?

I. $f(x) = \frac{x-4}{x^2-16}$

II. $g(x) = \frac{x-4}{x^2+16}$

III. $h(x) = \ln\left(\frac{1}{x}\right)$

(A) II only

(B) I and II only

(C) I and III only

(D) II and III only