

HW 14 : Unit 1 & 2 Test Review

Find the requested information and give your answer in interval notation. Show all work.

1. $f(x) = \sqrt{36 - x^2}$

Domain: _____

2. $f(x) = \frac{x+3}{x^2 - 3x - 18}$

Domain: _____

Range: _____

3. $f(x) = \frac{5x}{\sqrt{x+7}}$

Domain: _____

4. $f(x) = \frac{1}{\sqrt{x^2 - 49}}$

Domain: _____

5. $f(x) = \frac{1}{x^2 + 13}$

Domain: _____

6. $f(x) = \frac{1}{\sqrt{x^2 + 6x + 9}}$

Domain: _____

Find each limit. Show all work. If a limit does not exist, explain why.

7. $\lim_{x \rightarrow 0} \frac{\frac{1}{x+2} - \frac{1}{2}}{x} =$ _____

8. $\lim_{x \rightarrow 0} \frac{\tan x}{\sin(2x)} =$ _____

9. $\lim_{x \rightarrow \infty} \frac{\sqrt{3x^2 + 4}}{2x + 5} = \underline{\hspace{2cm}}$

10. $\lim_{x \rightarrow 5} \frac{\sqrt{x} - \sqrt{5}}{x - 5} = \underline{\hspace{2cm}}$

11. $\lim_{x \rightarrow 0} \frac{\sin(4x)}{\tan(4x)} = \underline{\hspace{2cm}}$

12. $\lim_{x \rightarrow 0} \frac{\tan(2x)}{\sin(3x)} = \underline{\hspace{2cm}}$

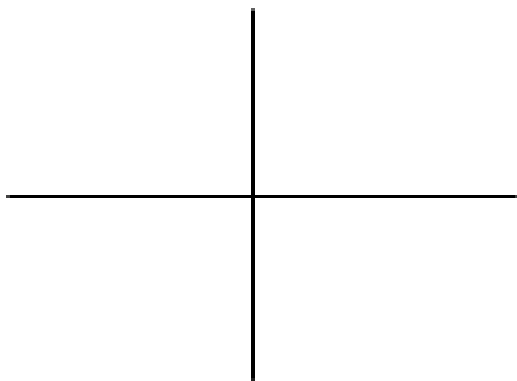
13. $\lim_{x \rightarrow 0} \frac{x^2 - 16}{x - 4} = \underline{\hspace{2cm}}$

14. $f(x) = \begin{cases} x^3, & x < -1 \\ x, & -1 < x < 1 \\ 1 - x, & x \geq 1 \end{cases}$

14a) $\lim_{x \rightarrow 1^-} f(x) = \underline{\hspace{2cm}}$ 14b) $\lim_{x \rightarrow 1^+} f(x) = \underline{\hspace{2cm}}$ 14c) $\lim_{x \rightarrow -1} f(x) = \underline{\hspace{2cm}}$ 14d) $f(1) = \underline{\hspace{2cm}}$

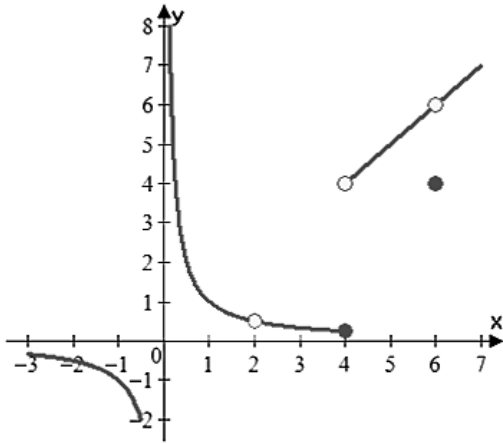
15. Graph the function. State the points of discontinuity and the type (removable, jump, infinite, oscillate).

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



Location	Type

16. State the points of discontinuity and the type (removable, jump, infinite, oscillate).

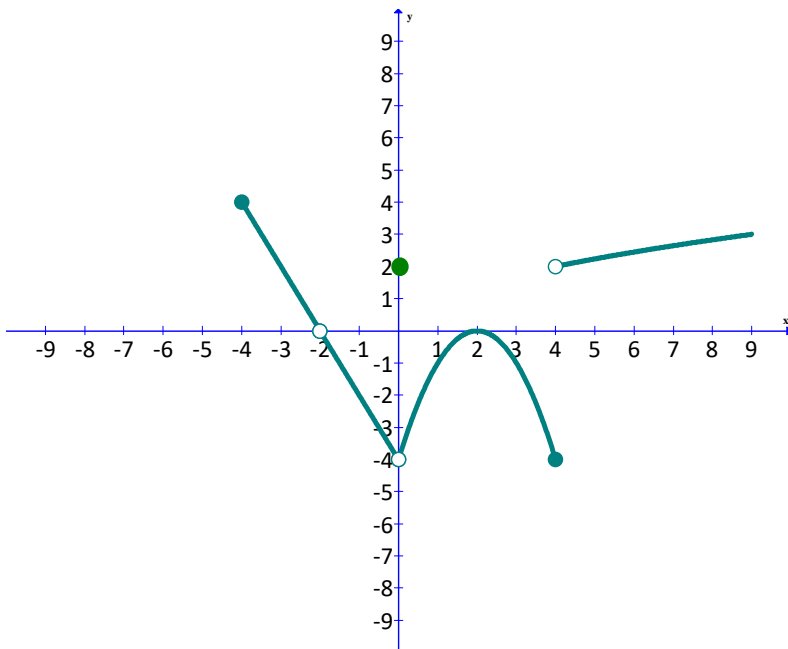


17. Use the sandwich (squeeze) theorem to evaluate the limit.

$$\lim_{x \rightarrow \infty} \frac{1 - \cos(3x)}{2x^2} = \underline{\hspace{2cm}}$$

18. Use the Intermediate Value Theorem to prove that the equation $x^5 - 4x^3 - 3x = -1$ has at least one solution between $x = 2$ and $x = 3$.

19. Find the requested information from the graph.



- a. $\lim_{x \rightarrow 4^-} f(x) =$
- b. $\lim_{x \rightarrow 4^+} f(x) =$
- c. $\lim_{x \rightarrow 4} f(x) =$
- d. $f(4) =$
- e. $\lim_{x \rightarrow 0^-} f(x) =$
- f. $\lim_{x \rightarrow 0^+} f(x) =$
- g. $\lim_{x \rightarrow 0} f(x) =$
- h. $f(0) =$