

AUC apCalculus BC

Classwork Assignment GP3.CWIII

In Exercises 49–64, find the limit (if it exists).

$$49. \lim_{x \rightarrow 0} \frac{x}{x^2 - x}$$

$$50. \lim_{x \rightarrow 0} \frac{3x}{x^2 + 2x}$$

$$51. \lim_{x \rightarrow 4} \frac{x - 4}{x^2 - 16}$$

$$52. \lim_{x \rightarrow 3} \frac{3 - x}{x^2 - 9}$$

$$53. \lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x^2 - 9}$$

$$54. \lim_{x \rightarrow 4} \frac{x^2 - 5x + 4}{x^2 - 2x - 8}$$

$$55. \lim_{x \rightarrow 4} \frac{\sqrt{x + 5} - 3}{x - 4}$$

$$56. \lim_{x \rightarrow 3} \frac{\sqrt{x + 1} - 2}{x - 3}$$

$$57. \lim_{x \rightarrow 0} \frac{\sqrt{x + 5} - \sqrt{5}}{x}$$

$$58. \lim_{x \rightarrow 0} \frac{\sqrt{2 + x} - \sqrt{2}}{x}$$

$$59. \lim_{x \rightarrow 0} \frac{[1/(3 + x)] - (1/3)}{x}$$

$$60. \lim_{x \rightarrow 0} \frac{[1/(x + 4)] - (1/4)}{x}$$

$$61. \lim_{\Delta x \rightarrow 0} \frac{2(x + \Delta x) - 2x}{\Delta x}$$

$$62. \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - x^2}{\Delta x}$$

$$63. \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - 2(x + \Delta x) + 1 - (x^2 - 2x + 1)}{\Delta x}$$

$$64. \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^3 - x^3}{\Delta x}$$

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In Exercises 11–26, find the limit (if it exists).

11. $\lim_{x \rightarrow 6} (x - 2)^2$

12. $\lim_{x \rightarrow 7} (10 - x)^4$

13. $\lim_{t \rightarrow 4} \sqrt{t + 2}$

14. $\lim_{y \rightarrow 4} 3|y - 1|$

15. $\lim_{t \rightarrow -2} \frac{t + 2}{t^2 - 4}$

16. $\lim_{t \rightarrow 3} \frac{t^2 - 9}{t - 3}$

17. $\lim_{x \rightarrow 4} \frac{\sqrt{x - 3} - 1}{x - 4}$

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

16. $\sum_{n=1}^{\infty} \frac{5}{4^n + 1}$

18. $\sum_{n=1}^{\infty} \frac{2^n + 1}{5^n + 1}$

20. $\sum_{n=1}^{\infty} \frac{n + 5}{n^3 - 2n + 3}$

22. $\sum_{n=1}^{\infty} \frac{1}{n^2(n + 3)}$

24. $\sum_{n=1}^{\infty} \frac{n}{(n + 1)2^{n-1}}$

26. $\sum_{n=1}^{\infty} \frac{5}{n + \sqrt{n^2 + 4}}$

28. $\sum_{n=1}^{\infty} \tan \frac{1}{n}$

Problem 13.1.

- (1) Graph the curve $r = -1 + 2\sin(\theta)$.
- (2) Find the area of the inner loop.