

$$\lim_{x \rightarrow \infty} \int_2^3 \frac{1}{dx} dy$$

TECHNIQUES FOR FINDING SOME LIMITS ANALYTICALLY

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Problem 1:

Given $f(x) = 3x + 3$, find $\lim_{x \rightarrow 2} f(x)$.

Problem 2:

Given $f(x) = x^4 - 3x^2 - 9$, find $\lim_{x \rightarrow 2} f(x)$.

Problem 3:

Given $f(x) = x^2$, find $\lim_{x \rightarrow 2} f(x)$.

Problem 4:

Given $f(x) = \frac{x+3}{x+6}$, find the following limits:

a. $\lim_{x \rightarrow 2} f(x)$

b. $\lim_{x \rightarrow -6} f(x)$

Problem 5:

Given $f(x) = \frac{x-2}{x^2-4}$, find the following limits:

a. $\lim_{x \rightarrow 1} f(x)$

b. $\lim_{x \rightarrow -2} f(x)$

c. $\lim_{x \rightarrow 2} f(x)$

Problem 6:

Given $f(x) = \frac{x^2 - 4}{x - 2}$, find the following limits:

a. $\lim_{x \rightarrow 1} f(x)$

b. $\lim_{x \rightarrow 2} f(x)$

Problem 7:

Given $f(x) = \sin x$, find $\lim_{x \rightarrow \frac{\pi}{2}} f(x)$.

Problem 8:

Given $f(x) = \cos x$, find $\lim_{x \rightarrow \frac{\pi}{3}} f(x)$.

Problem 9:

Given $f(x) = \tan x$, find the following limits:

a. $\lim_{x \rightarrow \frac{\pi}{3}} f(x)$

b. $\lim_{x \rightarrow \frac{\pi}{2}} f(x)$

Problem 10:

Given $f(x) = \sec x$, find the following limits:

a. $\lim_{x \rightarrow \frac{\pi}{3}} f(x)$

b. $\lim_{x \rightarrow \frac{3\pi}{2}} f(x)$

Problem 11:

Given $f(x) = \csc x$, find the following limits:

a. $\lim_{x \rightarrow \frac{\pi}{6}} f(x)$

b. $\lim_{x \rightarrow \pi} f(x)$

Problem 12:

Given $f(x) = \cot x$, find the following limits:

a. $\lim_{x \rightarrow \frac{\pi}{2}} f(x)$

b. $\lim_{x \rightarrow 0} f(x)$

Problem 13:

Given $f(x) = \frac{\sin 5x}{x}$, find $\lim_{x \rightarrow 0} f(x)$.

Problem 14:

Given $f(x) = \frac{\tan x}{x}$, find $\lim_{x \rightarrow 0} f(x)$.

Problem 15:

Given $f(x) = \frac{3(1 - \cos x)}{x}$, find $\lim_{x \rightarrow 0} f(x)$.

Problem 16:

Given $f(x) = \sqrt{x}$, find the following limits:

a. $\lim_{x \rightarrow 9} f(x)$

b. $\lim_{x \rightarrow 0} f(x)$

Problem 17:

Given $f(x) = \sqrt{4 - x^2}$, find the following limits:

a. $\lim_{x \rightarrow 0} f(x)$

b. $\lim_{x \rightarrow -2} f(x)$

c. $\lim_{x \rightarrow 2} f(x)$

Problem 18:

Given $f(x) = \sqrt[5]{3x^4 - 5x^2 + 2x}$, find $\lim_{x \rightarrow 1} f(x)$.

Problem 19:

Given $f(x) = \sqrt[5]{\frac{x^3 - 2x^2}{x - 3}}$, find $\lim_{x \rightarrow 4} f(x)$.

Problem 20:

Given $f(x) = x^{2/3}$, find $\lim_{x \rightarrow -8} f(x)$.



SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. 9	2. -5	3. 4	4. 5/8
5.a. 1/3	6.a. 3	7. 1	8. 1/2
5.b. Does not exist	6.b. 4		
5.c. 1/4			
9.a. $\sqrt{3}$	10.a. 2	11.a. 2	12.a. 0
9.b. Does not exist	10.b. Does not exist	11.b. Does not exist	12.b. Does not exist
13. 5	14. 1	15. 0	16.a. 3
			16.b. Does not exist
17.a. 2			
17.b. Does not exist	18. 0	19. 2	20. 4
17.c. Does not exist			