King Abdul Aziz University — Faculty of Sciences
Mathematics Department — Math 110
Workshop 8 — Section 3.3
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1) If $f(x)=\begin{cases}2x+3 & ;x\geq -2\\ 2x+5 & ;x<-2\end{cases}$, then $\lim\limits_{x\to(-2)^-} f(x)=$

[a] 3 [b] 5 [c] 1 [d] −1

2) If $f(x)=\begin{cases}2x+3 & ;x\geq -2\\ 2x+5 & ;x<-2\end{cases}$, then $\lim\limits_{x\to(-2)^+} f(x)=$

[a] 3 [b] 5 [c] 1 [d] −1

3) If $f(x)=\begin{cases}2x+3 & ;x\geq -2\\ 2x+5 & ;x<-2\end{cases}$, then $\lim\limits_{x\to -2} f(x)=$

[a] 3 [b] does not exist [c] 1 [d] −1

4) If $f(x)=\begin{cases}x^2-2x+3 & ;x\geq 3\\ x^3-3x-12 & ;x<3\end{cases}$, then $\lim\limits_{x\to 3} f(x)=$

[a] 6 [b] does not exist [c] 21 [d] −6

5) If $f(x)=\begin{cases}x^2-7x & ;x<1\\ 5 & ;1\leq x\leq 3\\ 3x+1 & ;3<x\end{cases}$, then $\lim\limits_{x\to 1^-} f(x)=$

[a] 5 [b] does not exist [c] 10 [d] −6

6) If $f(x)=\begin{cases}x^2-7x & ;x<1\\ 5 & ;1\leq x\leq 3\\ 3x+1 & ;3<x\end{cases}$, then $\lim\limits_{x\to 1^+} f(x)=$

[a] 5 [b] does not exist [c] 10 [d] −6

7) If $f(x)=\begin{cases}x^2-7x & ;x<1\\ 5 & ;1\leq x\leq 3\\ 3x+1 & ;3<x\end{cases}$, then $\lim\limits_{x\to 3^-} f(x)=$

[a] 5 [b] does not exist [c] 10 [d] −6

8) If $f(x)=\begin{cases}x^2-7x & ;x<1\\ 5 & ;1\leq x\leq 3\\ 3x+1 & ;3<x\end{cases}$, then $\lim\limits_{x\to 3^+} f(x)=$

[a] 5 [b] does not exist [c] 10 [d] −6

9) If $f(x)=\begin{cases}\dfrac{x^2+x-6}{x^2-4} & ;x^2-4>0\\ \dfrac{x^2+x-6}{4-x^2} & ;x^2-4<0\end{cases}$, then $\lim\limits_{x\to 2^+} f(x)=$

[a] $\frac{5}{4}$ [b] does not exist [c] $-\frac{5}{4}$ [d] 0

10) If $f(x)=\begin{cases}\dfrac{x^2+x-6}{x^2-4} & ;x^2-4>0\\ \dfrac{x^2+x-6}{4-x^2} & ;x^2-4<0\end{cases}$, then $\lim\limits_{x\to 2^-} f(x)=$

[a] $\frac{5}{4}$ [b] does not exist [c] $-\frac{5}{4}$ [d] 0

11) $\lim\limits_{x\to a^-}\dfrac{|x-a|}{x-a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

12) $\lim\limits_{x\to a^+}\dfrac{|x-a|}{x-a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

13) $\lim\limits_{x\to a}\dfrac{|x-a|}{x-a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

14) $\lim\limits_{x\to a^+}\dfrac{|a-x|}{x-a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

15) $\lim\limits_{x\to a^-}\dfrac{|a-x|}{x-a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

16) $\lim\limits_{x\to a}\dfrac{|a-x|}{x-a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

17) $\lim\limits_{x\to -a^-}\dfrac{|x+a|}{x+a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

18) $\lim_{x\to -a^+}\frac{|x+a|}{x+a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

19) $\lim_{x\to -a}\frac{|x+a|}{x+a}=$

[a] does not exist [b] 0 [c] 1 [d] −1

20) $\lim_{x\to 0^+}\frac{2x-|x|}{x^2+|x|}=$

[a] does not exist [b] −3 [c] 1 [d] −1

21) $\lim_{x\to 0^-}\frac{2x-|x|}{x^2+|x|}=$

[a] does not exist [b] −3 [c] 1 [d] 3

22) $\lim_{x\to 0}\frac{2x-|x|}{x^2+|x|}=$

[a] does not exist [b] −3 [c] 1 [d] 3

23) $\lim_{x\to \frac{\pi}{4}}\frac{\cos x-\sin x}{\cos^2 x-\sin^2 x}=$

[a] does not exist [b] $\sqrt{2}$ [c] $\frac{\sqrt{2}}{2}$ [d] 0

24) $\lim_{x\to 0}\frac{\cos^2 x+2\cos x-3}{2\cos^2 x-\cos x-1}=$

[a] does not exist [b] $\frac{4}{3}$ [c] 3 [d] 0

25) $\lim_{x\to 0}\left(\sin^2 x+3\tan x-4\right)=$

[a] does not exist [b] −1 [c] 0 [d] −4

26) If $m\neq 0$, then $\lim_{x\to 0}\frac{\sin(nx)}{mx}=$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

27) If $m\neq 0$, then $\lim_{x\to 0}\frac{\tan(nx)}{mx}=$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

28) If $m \neq 0$, then $\lim_{x \to 0} \frac{nx}{\sin(mx)} =$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

29) If $m \neq 0$, then $\lim_{x \to 0} \frac{nx}{\tan(mx)} =$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

30) If $m \neq 0$, then $\lim_{x \to 0} \frac{\sin(nx)}{\sin(mx)} =$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

31) If $m \neq 0$, then $\lim_{x \to 0} \frac{\sin(nx)}{\tan(mx)} =$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

32) If $m \neq 0$, then $\lim_{x \to 0} \frac{\tan(nx)}{\tan(mx)} =$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

33) If $m \neq 0$, then $\lim_{x \to 0} \frac{\tan(nx)}{\sin(mx)} =$

[a] does not exist [b] $\frac{n}{m}$ [c] $\frac{m}{n}$ [d] n

34) $\lim_{x \to 0} \frac{\sin(1-\cos x)}{1-\cos x} =$

[a] does not exist [b] -1 [c] 1 [d] 0

35) $\lim_{x \to 0} \frac{\sin(\sin(2x))}{\sin(2x)} =$

[a] does not exist [b] -1 [c] 1 [d] 0

36) $\lim_{x \to 0} \frac{1-\cos(2x)}{x^2} =$

[a] does not exist [b] $\frac{1}{2}$ [c] 0 [d] 2

37) $\lim_{x\to\infty}\sqrt{\frac{1}{x^2}-\frac{3}{x}+4}=$

[a] $-\infty$ [b] ± 2 [c] 2 [d] ∞

38) $\lim_{x\to-\infty}\left(\frac{1}{x^{2/5}}+2\right)=$

[a] 0 [b] ∞ [c] $-\infty$ [d] 2

39) $\lim_{x\to\infty}\frac{3x+15}{9x^2+4x-13}=$

[a] 0 [b] $\frac{1}{9}$ [c] $\frac{1}{3}$ [d] ∞

40) $\lim_{x\to\infty}\frac{3x^2-8x+15}{9x^2+4x-13}=$

[a] 0 [b] $\frac{1}{9}$ [c] $\frac{1}{3}$ [d] ∞

41) $\lim_{x\to-\infty}\frac{3x^2-8x+15}{9x^2+4x-13}=$

[a] 0 [b] $\frac{1}{9}$ [c] $\frac{1}{3}$ [d] ∞

42) $\lim_{x\to\infty}\frac{3x^5-8x+15}{9x^2+4x-13}=$

[a] 0 [b] $\frac{1}{9}$ [c] $\frac{1}{3}$ [d] ∞

43) $\lim_{x\to-\infty}\frac{3x^5-8x+15}{9x^2+4x-13}=$

[a] 0 [b] $-\infty$ [c] $\frac{1}{3}$ [d] ∞

44) $\lim_{x\to\infty}\left(\sqrt{x^2-3x+7}-x\right)=$

[a] ∞ [b] $-\frac{3}{2}$ [c] 0 [d] $\frac{3}{2}$

45) $\lim_{x\to\infty}\left(\sqrt{x^2+x}-x\right)=$

[a] 1 [b] $-\frac{1}{2}$ [c] 0 [d] $\frac{1}{2}$

46) $\lim_{x\to\infty}\left(x^2-5x+4\right)=$

[a] $-\infty$ [b] 0 [c] 4 [d] ∞

47) $\lim_{x\to-\infty}\left(x^4-2x^3+9\right)=$

[a] $-\infty$ [b] 0 [c] 9 [d] ∞

48) $\lim_{x\to-\infty}\frac{\sqrt{3x^2-8}+2}{x+5}=$

[a] $-\infty$ [b] $\sqrt{3}$ [c] $-\sqrt{3}$ [d] ∞

49) $\lim_{x\to\infty}\frac{\sqrt{3x^2-8}+2}{x+5}=$

[a] $-\infty$ [b] $\sqrt{3}$ [c] $-\sqrt{3}$ [d] ∞

50) The horizontal asymptote of $f(x)=\frac{\sqrt{3x^2-8}+2}{x+5}$ is

[a] $y=\pm3$ [b] $x=\pm3$ [c] $x=\pm\sqrt{3}$ [d] $y=\pm\sqrt{3}$

51) The horizontal asymptote of $f(x)=\frac{1-x}{2x+1}$ is

[a] $y=-\frac{1}{2}$ [b] $x=\frac{1}{2}$ [c] $x=-\frac{1}{2}$ [d] $y=\frac{1}{2}$

52) The horizontal asymptote of $f(x)=\frac{7x^2+5}{3x^2+2}$ is

[a] $y=\frac{7}{3}$ [b] $y=-\frac{7}{3}$ [c] $x=-\frac{7}{3}$ [d] $x=\frac{7}{3}$

53) The horizontal asymptote of $f(x)=\frac{\sqrt{x^2+2x-3}}{2x+7}$ is

[a] $y=\pm\frac{1}{2}$ [b] $x=\pm\frac{1}{2}$ [c] $x=\pm2$ [d] $y=\pm2$

54) The horizontal asymptote of $f(x)=\frac{\sqrt{2x-3}}{2x^2+7x-1}$ is

[a] $y=-2$ [b] $x=2$ [c] $x=0$ [d] $y=0$

55) $\lim_{x\to-\infty}\frac{\sqrt{4x^2-8}+3}{x+1}=$

[a] $-\infty$ [b] 2 [c] -2 [d] ∞

56) $\lim_{x\to\infty}\frac{\sqrt{4x^2-8}+3}{x+1}=$

[a] $-\infty$ [b] 2 [c] -2 [d] ∞