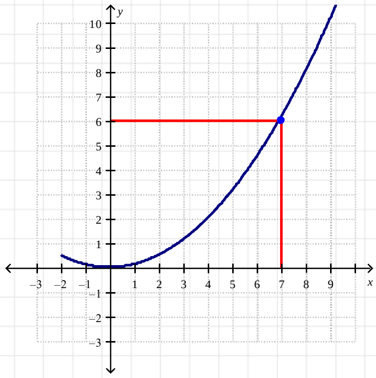
1. LIMIT of a FUNCTION

Limit is the value that a function **approaches** as the input approaches some certain value.

Let's understand the concept of limit by observing following function graph.

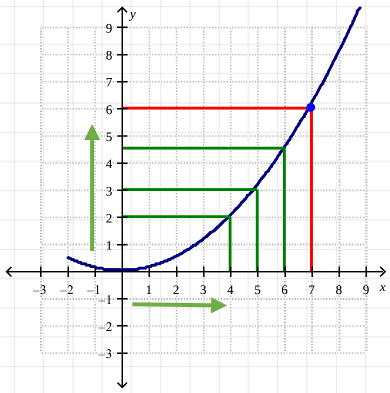


In this graph, at $x = 7$ function has a value of $f(7) = 6$.

We can approach $x = 7$ point from two directions on the x-axis.

1) From left (as x values getting bigger).
2) From right (as x values getting smaller).

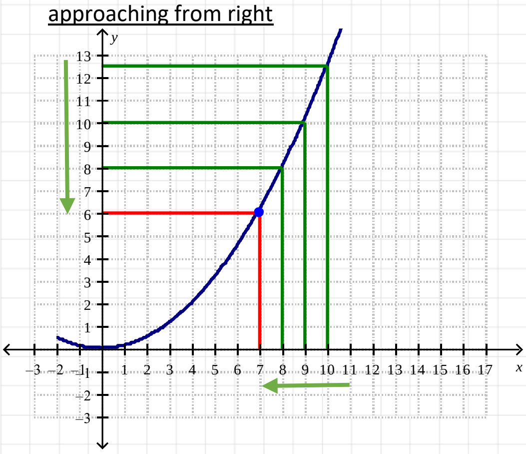
<u>approaching from left</u>



Observe that as x values approach to $x = 7$, $f(x)$ values approach to 6.

This is called left hand limit of $f(x)$ at $x = 7$ and denoted as $\lim\limits_{x \to 7^-} f(x) = 6$.

<u>approaching from right</u>



Observe that as x values approach to $x = 7$, $f(x)$ values approach to 6.

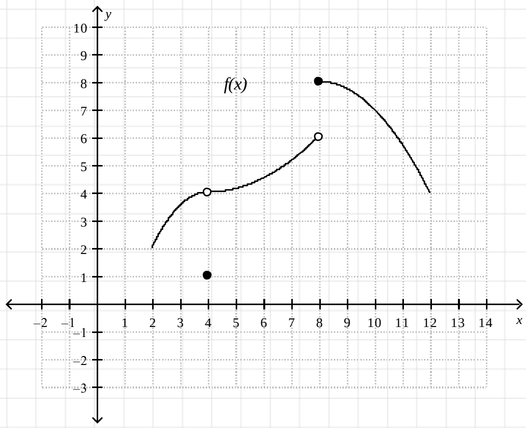
This is called right hand limit of $f(x)$ at $x = 7$ and denoted as $\lim\limits_{x \to 7^+} f(x) = 6$.

Existence of a Limit:

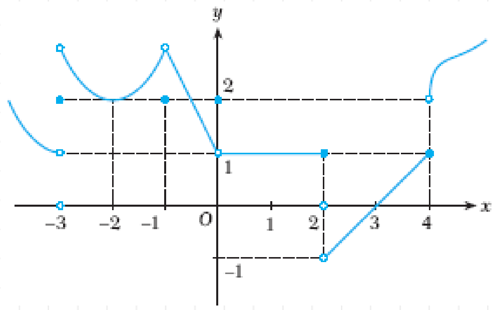
The limit of a function $f(x)$ at a point x_0 exists if and only if the right-hand and left-hand limits at x_0 exist and are equal.
That is;

$$\lim_{x \to x_0} f(x) = L \Leftrightarrow \begin{matrix} \lim\limits_{x \to x_0^-} f(x) = L \\ and \\ \lim\limits_{x \to x_0^+} f(x) = L \end{matrix}$$

Example: Examine the limit of following $f(x)$ where $f : [2,12] \to \mathbb{R}$ function at $x = 2$, $x = 4$, $x = 7$, $x = 8$, $x = 12$.



Example: The graph of *f* is shown in the figure. At which integer values of *x* in the interval $(-\frac{7}{2}, \frac{9}{2})$ does the limit exist?



Example: Examine the limit of

$$f(x) = \begin{cases} 2x + 1; & x > -3 \\ -2 + x; & x < -3 \end{cases}$$ at $x = -3$.

Limit of a Polynomial Function:

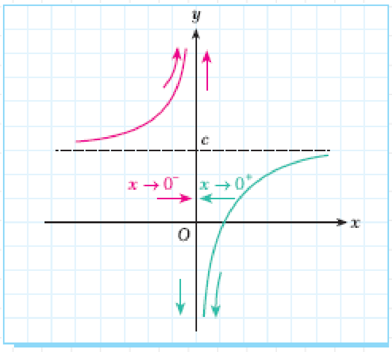
Limit of any polynomial function $f(x)$ as x approaches to x_0 is $f(c)$.
That is,
For any $f(x) = a_n x^n + a_{n-1}x^{n-1} + \ldots + a_1 x + a_0$
$\lim\limits_{x \to x_0} f(x) = f(x_0)$

Example: Find the limit of $f(x) = x^3 + 2x^2 - 4x + 1$ at $x = 2$.

Example: Find the limit of $f(t) = 1 - 3t^2 + 2t$ at -1.

Limits Involving Infinity

Let us study on the limits of the function graphed in the figure.

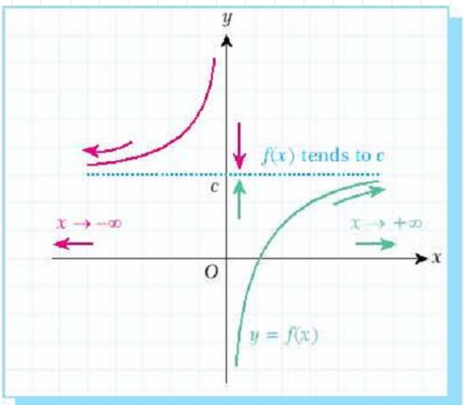


$f : R - \{0\} \to R - \{c\}$

$\lim\limits_{x \to 0^+} f(x) = \ldots\ldots$

$\lim\limits_{x \to 0^-} f(x) = \ldots\ldots$

Note : "infinity - ∞ " is NOT a real number. It is a concept which describes the situation in which a function continues without end in a positive or negative direction.



$f : R - \{0\} \to R - \{c\}$

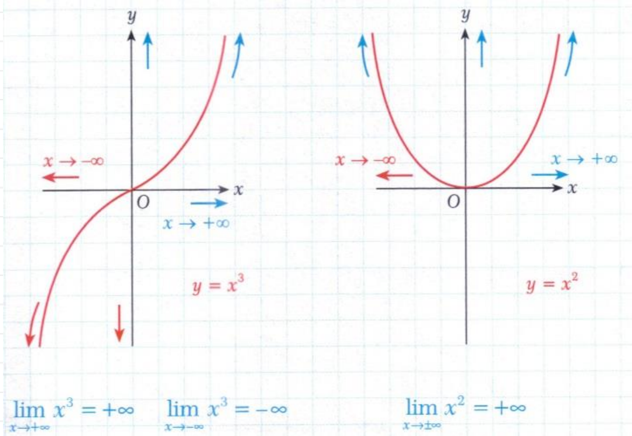
$\lim\limits_{x \to \infty} f(x) = \ldots\ldots$ $\lim\limits_{x \to -\infty} f(x) = \ldots\ldots$

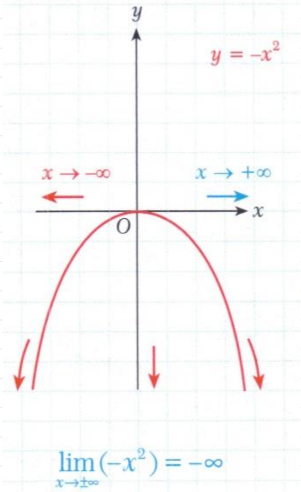
Remark:
For some functions the following limits are possible.

$\lim\limits_{x \to +\infty} f(x) = +\infty$ $\lim\limits_{x \to +\infty} f(x) = -\infty$

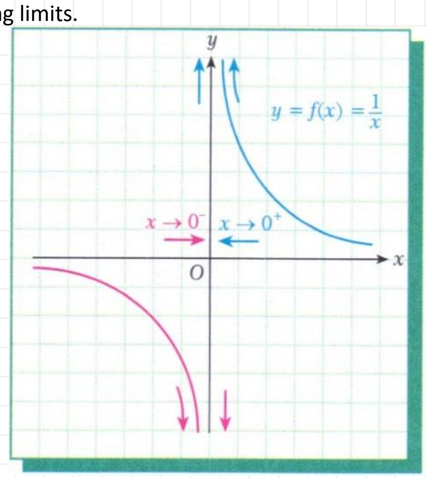
$\lim\limits_{x \to -\infty} f(x) = +\infty$ $\lim\limits_{x \to -\infty} f(x) = -\infty$

Example:





Example: Given $f : R - \{0\} \to R$, $f(x) = \dfrac{1}{x}$ then calculate the following limits.



$\lim\limits_{x \to 0^+} f(x) = \ldots$ $\lim\limits_{x \to 0^-} f(x) = \ldots$

$\lim\limits_{x \to +\infty} f(x) = \ldots$ $\lim\limits_{x \to -\infty} f(x) = \ldots$

Example: Given $f:R-\{2\}\to R$, $f(x)=\dfrac{1}{x-2}$ then calculate the following limits.

$\lim\limits_{x\to 2^+} f(x)=$

$\lim\limits_{x\to 2^-} f(x)=$

$\lim\limits_{x\to 2} f(x)=$

Example: Find the limit of the function $f:\mathbb{R}\to\mathbb{R}$, $f(x)=\dfrac{3x^2+x}{x^2-5}$ as x approaches to $+\infty$.

Limit Combination Theorem:

Let $f(x)$ and $g(x)$ be functions such that $\lim\limits_{x\to x_0} f(x)=a$ and $\lim\limits_{x\to x_0} g(x)=b$. Then

a) $\lim\limits_{x\to x_0}[f(x)+g(x)]=a+b$

b) $\lim\limits_{x\to x_0}[f(x)-g(x)]=a-b$

c) $\lim\limits_{x\to x_0}[f(x)\cdot g(x)]=a\cdot b$

d) $\lim\limits_{x\to x_0}[\dfrac{f(x)}{g(x)}]=\dfrac{a}{b}(b\neq 0)$

e) $\lim\limits_{x\to x_0} k\cdot f(x)=k\cdot a\ (k\in R)$

Example: Given $f(x)=3$ and $g(x)=\dfrac{1}{x}\ (x\neq 0)$ then evaluate the following limits.

$\lim\limits_{x\to -2}[f(x)+g(x)]=\ldots$

$\lim\limits_{x\to +\infty}[f(x)\cdot g(x)]=\ldots$

$\lim\limits_{x\to -3}[\dfrac{f(x)}{g(x)}]=\ldots$

Example: Perform the following limits

- $\lim\limits_{x\to 6}(25^{\frac{1}{x-5}})=\ldots$
- $\lim\limits_{x\to 2}(\dfrac{2+3^{\frac{1}{x}}}{1+4^{\frac{1}{x}}})=\ldots$
- $\lim\limits_{x\to 0}(\sqrt{2^{1-x^2}})$
- $\lim\limits_{x\to -3}(2^{\sqrt{1-x}})$
- $\lim\limits_{x\to 0}(5^{\frac{1}{x}})$

Example: Given $f:R-\{0\}\to R$, $f(x)=\dfrac{1}{1+2^{2/x}}$ and $g(x)=\dfrac{1}{x}$ then find the following limits.

$\lim\limits_{x\to 0} f(x)=\ldots$

$\lim\limits_{x\to 0} g(x)=\ldots$

$\lim\limits_{x\to 0}(f(x)\cdot g(x))=\ldots$

Exercises 2.1 – Page 71 in Zambak

Part A, B, D, F

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2. INDETERMINATE FORMS

The situation in which the value of a function of a point may not be defined in real numbers is called **indeterminate form.**

A. $\frac{0}{0}$ As a Limit

If $f(x_0)=0$ and $g(x_0)=0$, then $\lim\limits_{x\to x_0}\frac{f(x)}{g(x)}=\frac{0}{0}$.

In this case, there exists a function $h(x)$ which is a common factor of f and g such that $h(x_0)=0$. So, we get

$$\lim_{x\to x_0}\frac{f(x)}{g(x)}=\lim_{x\to x_0}\frac{f_1(x)\cdot h(x)}{g_1(x)\cdot h(x)}$$

Since $x\neq x_0$ we can cancel the factors. So,

$$\lim_{x\to x_0}\frac{f(x)}{g(x)}=\lim_{x\to x_0}\frac{f_1(x)\cdot h(x)}{g_1(x)\cdot h(x)}=\frac{f_1(x)}{g_1(x)}=\frac{f_1(x_0)}{g_1(x_0)}$$

Example: Calculate the limits below.

- $\lim\limits_{x\to 5}\frac{x^2-25}{x-5}=$

- (UN 2011 PAKET 21)
  $\lim\limits_{x\to 4}\frac{x-4}{\sqrt{x}-2}=$

- $\lim\limits_{x\to -1}\frac{x^2-5x-6}{x+1}=$

- (UN 2008 PAKET A/B)
  $\lim\limits_{x\to 2}\frac{x^2-5x+6}{x^2+2x-8}=$

- (UN 2012/D49)
  $\lim\limits_{x\to 1}\frac{1-x}{2-\sqrt{x+3}}=$

- (UN 2010 PAKET A)
  $\lim\limits_{x\to 0}\left(\frac{3x}{\sqrt{9+x}-\sqrt{9-x}}\right)=$

- $\lim\limits_{x\to 0}\frac{\sqrt[3]{1+x}-1}{x}=$

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The Indeterminate Form $\frac{0}{0}$ in Trigonometric Functions

$$\lim_{x\to 0}\frac{\sin x}{x}=\frac{0}{0}$$

Theorem: $\lim_{x\to 0}\frac{\sin x}{x}=1$

Example: Find the following limits based on the theorem.

- $\lim_{x\to 0}\frac{\tan x}{x}=\ldots$

- $\lim_{x\to 0}\frac{\sin ax}{bx}=\ldots$

Generalization: The following results can be obtained also by solving as in the last two examples.

$$\lim_{x\to 0}\frac{\sin ax}{bx}=\lim_{x\to 0}\frac{ax}{\sin bx}=\lim_{x\to 0}\frac{\sin ax}{\sin bx}=\frac{a}{b}$$
$$\lim_{x\to 0}\frac{\tan ax}{bx}=\lim_{x\to 0}\frac{ax}{\tan bx}=\lim_{x\to 0}\frac{\tan ax}{\tan bx}=\frac{a}{b}$$
$$\lim_{x\to 0}\frac{\sin ax}{\tan bx}=\lim_{x\to 0}\frac{\tan ax}{\sin bx}=\frac{a}{b}$$

Example: Find the following limits.

- $\lim_{x\to 0}\frac{\sin 2x}{3x}=$

- $\lim_{x\to 0}\frac{\sin 2x}{\tan x}=$

- $\lim_{x\to 0}\frac{2\sin\frac{x}{2}}{\tan\frac{x}{3}}=$

- $\lim_{x\to 0}\frac{(x+2)\tan 6x}{\sin 3x}=$

- $\lim_{x\to 0}\frac{\sin(x-3)}{x-3}=$

- $\lim_{x\to 1}\frac{\tan(x-1)}{4x-4}=$

Example: Calculate the limits below.

- (UN 2010 PAKET B)

  $\lim_{x\to 0}\left(\frac{\sin x+\sin 5x}{6x}\right)=$

- $\lim_{x\to -2}\frac{4-x^2}{\sin(2-x)}=$

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- (UN 2007 PAKET B)

$$\lim_{x\to 2}\frac{\sin(x-2)}{x^2-3x+2}=$$

- $$\lim_{x\to 0}\frac{5x^2}{\sin^2(\frac{x}{3})}=$$

- $$\lim_{x\to \frac{\pi}{2}}\frac{\cos x}{\pi-2x}=$$

- (UN 2011 PAKET 12)

$$\lim_{x\to 0}\left(\frac{1-\cos 2x}{2x\cdot\sin 2x}\right)=$$

- (UN 2012/C37)

$$\lim_{x\to 0}\left(\frac{1-\cos 2x}{x\cdot\tan 2x}\right)=$$

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B. $\frac{\infty}{\infty}$ As a Limit

Let $f(x)=a_nx^n+a_{n-1}x^{n-1}+\cdots\cdots+a_1x+a_0$ and $g(x)=b_mx^m+b_{m-1}x^{m-1}+\cdots\cdots+b_1x+b_0$ be two polynomials.

Then,

$\lim\limits_{x\to\pm\infty} f(x)=\pm\infty$ And $\lim\limits_{x\to\pm\infty} g(x)=\pm\infty$. So, $\lim\limits_{x\to\pm\infty}\frac{f(x)}{g(x)}=\frac{\infty}{\infty}$

In this case,

$$\lim_{x\to\pm\infty}\frac{f(x)}{g(x)}=\frac{x^n\left(a_n+\frac{a_{n-1}}{x}+\cdots\cdots+\frac{a_1}{x^{n-1}}x+\frac{a_0}{x^n}\right)}{x^m\left(b_m+\frac{b_{m-1}}{x}+\cdots\cdots+\frac{b_1}{x^{m-1}}+\frac{b_1}{x^m}\right)}$$

$$=\lim_{x\to\pm\infty}\frac{f(x)}{g(x)}=\frac{a_nx^n}{b_mx^m}=\begin{cases}\frac{a_n}{b_m} & if\ n=m\\ 0 & if\ n<m\\ \pm\infty & if\ n>m\end{cases}$$

Example: Calculate the limits below.

- $\lim\limits_{x\to\infty}\dfrac{x^4+2x}{x^3+5}=$

- $\lim\limits_{x\to\infty}\dfrac{4x^2+5x+3}{x^3+2x-1}=$

- $\lim\limits_{x\to-\infty}\dfrac{5x^4+11x^2+2}{3x^4+5x^3-2}=$

- $\lim\limits_{x\to-\infty}\dfrac{\sqrt{x^2-2}}{3x+1}=$

- $\lim\limits_{x\to\infty}\dfrac{(2x^3-3x^2+1)(3x^2+x+11)}{(4x^4+x^3-2x+1)(5x-2)}=$

- $\lim\limits_{x\to-\infty}\dfrac{(2x^3-3+1)^2(x^2-x+1)^3}{(x^4+x+2)^2(3x^2+2x+5)^2}=$

- $\lim\limits_{x\to 0}\dfrac{\cot 4x}{\cot 5x}=$

- $\lim\limits_{x\to\infty}\dfrac{2^x-2^{-x}}{2^x+2^{-x}}=$

- $\lim\limits_{x\to\infty}\dfrac{2^x+2\cdot 3^x+1}{3^x+5\cdot 2^x-1}=$

- $\lim\limits_{x\to\infty}\dfrac{2^{x+1}+2^x}{2^{x+2}+2^x}=$

C. $0.\infty$ As a Limit

If $\lim\limits_{x\to x_0} f(x)=0$ and $\lim\limits_{x\to x_0} g(x)=\pm\infty$, then $\lim\limits_{x\to x_0}\left[f(x)\cdot g(x)\right]=0\cdot\infty$.

In this case, transform $0\cdot\infty$ into the indeterminate form of $\dfrac{0}{0}$ or $\dfrac{\infty}{\infty}$.

Example: Calculate the limits below.

- $\lim\limits_{x\to\infty}\left(x\cdot\sin\dfrac{1}{x}\right)=$

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- $\lim\limits_{x\to 0}(3x\cdot\cot 2x)=$

- $\lim\limits_{x\to -\infty}(2x-5)\cdot\dfrac{1}{x-2}=$

- $\lim\limits_{x\to -\pi}\sin x\cdot\dfrac{1}{\pi+x}=$

- $\lim\limits_{x\to\infty}\left(x^2\cdot\left(1-\cos^2\dfrac{1}{x}\right)\right)=$

D. $\infty-\infty$ As a Limit

If $\lim\limits_{x\to x_0}f(x)=\infty$ and $\lim\limits_{x\to x_0}g(x)=\infty$, then $\lim\limits_{x\to x_0}[f(x)-g(x)]=\infty-\infty$.

In this case, transform $\infty-\infty$ into the indeterminate form $\dfrac{0}{0}$ or $\dfrac{\infty}{\infty}$.

Example: Calculate the limits below.

- (UN 2010 PAKET B)
  $\lim\limits_{x\to 0}\left(\dfrac{2}{x-2}-\dfrac{8}{x^2-4}\right)=$

- $\lim\limits_{x\to\pi}\left(\dfrac{1}{\sin x}-\dfrac{1}{\tan x}\right)=$

- $\lim\limits_{x\to\infty}\sqrt{x^2+2x+5}-\sqrt{x^2+6x+1}=$

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

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

- (UN 2005)
  $\lim_{x\to\infty} \left(\sqrt{x(4x+5)}-2x+1\right) =$

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

- (UN 2009 PAKET A/B)
  $\lim_{x\to\infty} \frac{\sqrt{5x+4}-\sqrt{3x+9}}{4x} =$

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

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Exercises 2.2 – Page 92 in Zambak

1-a,b,e,f,i
2-a,b,c,d,e,h,j
3-a,b,c,f,h,k
4-a,b,d,e
5-a,d,e
6-a,b,d,f
7-a,d,e,h,i

3. CONTINUITY

Continuity at a Point

If $\lim\limits_{x \to x_0} f(x) = f(x_0)$ then we say f is **continuous** at x_0.

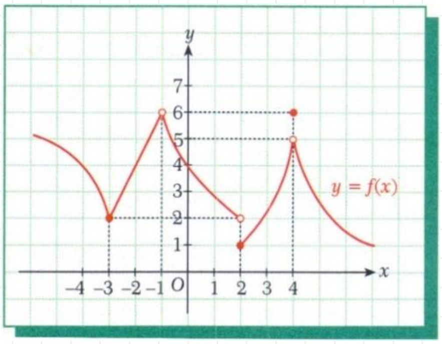
Otherwise, f is **discontinuous** at x_0.

For a function f to be continuous at x_0, followings are necessary:

1. $\lim\limits_{x \to x_0} f(x)$ must exist.
2. $f(x_0)$ must exist.
3. $\lim\limits_{x \to x_0} f(x) = f(x_0)$ must be satisfied.

In roughly speaking, if we can draw the graph of a function without lifting our hand then the function is continuous.

Example: Examine the continuity of $f(x)$ at $x=-3$, $x=-1$, $x=2$, $x=4$.



Example: Examine the continuity of $f(x) = \begin{cases} x^2 & \text{if } x<1 \\ 1 & \text{if } x=1 \\ 2-x & \text{if } x>1 \end{cases}$ at $x=1$.

Example: Examine the continuity of $f(x) = \begin{cases} 2x & \text{if } x=2 \\ \dfrac{x^2-4}{x-2} & \text{if } x \neq 2 \end{cases}$ at $x=2$.

Example: The function $f(x)$ is defined as

$$f(x) = \begin{cases} ax+b, & x>-1 \\ 4, & x=-1 \\ 2b, & x<-1 \end{cases}$$

If the function $f(x)$ is continuous at $x=-1$, then $a+b=?$

Theorem: If f and g are two continuous functions at x_0, then so are

1. $\alpha \cdot f(x)$ where $(\alpha \in \mathbb{R})$
2. $f(x) \pm g(x)$
3. $f(x) \cdot g(x)$
4. $\dfrac{f(x)}{g(x)}$ where $(g(x) \neq 0)$

Exercises 3.1 – Page 121 in Zambak

Part A

Review Test

1. $\lim\limits_{x\to 6}(3x-4)=?$

A) 0 B)-4 C) 14 D) 36 E) $+\infty$

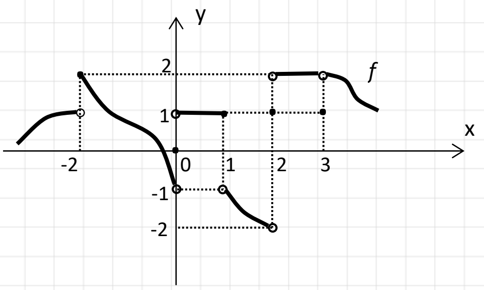
2. $\lim\limits_{x\to 0}(5x^2-3x+4)=?$

A) –4 B) -1 C) 0 D) 1 E) 4

3. If $\lim\limits_{x\to a-1}(x^2+a)=3$, then find the sum of the values of *a*.

A) -3 B) –1 C) 0 D) 1 E) 3

4. At which points does the function *f* have no limit?



A) {-2,2} B) {-2,0,1,2,3} C) {0,1,2}
D) {-2,0,1,2} E) {-2,0,1}

5. $f(x)=\begin{Bmatrix} 2x^2-1, x\geq 0 \\ 3x-1, x<0 \end{Bmatrix} \Rightarrow \lim\limits_{x\to 0} f(x)=?$

A) 0 B) -1 C) 1 D) ∞ E) Not Exist

6. $f(x)=\begin{cases} 2x-1, & x\geq 2 \\ x^2-1, & -2<x<2 \\ x-1, & x<-2 \end{cases}$

What is $\lim\limits_{x\to -2} f(x)$?

A) 1 B) -2 C) 3 D) -3 E) Not Exist

7. (UN 2003)

$\lim\limits_{x\to 2}\dfrac{4-x^2}{3-\sqrt{x^2+5}}=?$

A)-12 B)-6 C)0 D)6 E)12

8. $\lim\limits_{x\to 4}\dfrac{x-4}{\sqrt{x}-2}=?$

A) 0 B) 1 C) 2 D) 4 E) 8

9. $\lim\limits_{x\to\sqrt{2}}\dfrac{x-\sqrt{2}}{x^2-2}=?$

A) $\dfrac{1}{2\sqrt{2}}$ B) 0 C) ∞ D) $\dfrac{1}{\sqrt{2}}$ E) $-\dfrac{1}{\sqrt{2}}$

10. $\lim\limits_{x\to 64}\dfrac{\sqrt[3]{x}-4}{\sqrt{x}-8}=?$

A) 3 B) 2/3 C) 3/2 D) 1/3 E) 0

11. (UN 2009 PAKET A/B)

$$\lim_{x \to -2} \frac{x+2}{\sqrt{5x+14}-2} = ?$$

A)4 B)2 C)1.2 D)0.8 E)0.4

12. (UN 2006)

$$\lim_{x \to 0} \frac{\sqrt{4+2x}-\sqrt{4-2x}}{x} = ?$$

A)4 B)2 C)1 D)0 E)-1

13. $\lim_{x \to 0} \frac{\sin 2x}{\tan 5x} = ?$

A) $\frac{5}{2}$ B) $\frac{2}{5}$ C) 0 D) 2 E)5

14. (UN 2010 PAKET A)

$$\lim_{x \to 0} \left(\frac{\cos 4x \cdot \sin 3x}{5x} \right) = ?$$

A) $\frac{5}{3}$ B) 1 C) $\frac{3}{5}$ D) $\frac{1}{5}$ E)0

15. $\lim_{x \to \pi} \frac{\sin x \cdot \sin 2x}{2-2\cos^2 x} = ?$

A) 1 B) $\frac{1}{2}$ C) 0 D) $-\frac{1}{2}$ E) -1

16. (UN 2007 PAKET A)

$$\lim_{x \to 0} \left(\frac{2x \cdot \sin 3x}{1-\cos 6x} \right) = ?$$

A) -1 B) $-\frac{1}{3}$ C) 0 D) $\frac{1}{3}$ E) 1

17. (UN 2005)

$$\lim_{x \to 0} \frac{\sin 12x}{2x\left(x^2+2x-3\right)} = ?$$

A) -4 B) -3 C) -2 D) 2 E) 6

18. (UN 2012/D49)

$$\lim_{x \to 0} \frac{\cos 4x - 1}{x \cdot \tan 2x} = ?$$

A) 4 B) 2 C) -1 D) -2 E) -4

19. (UN 2012/B25)

$$\lim_{x \to 0} \left(\frac{x \cdot \tan x}{1-\cos 2x} \right) = ?$$

A) $-\frac{1}{2}$ B) 0 C) $\frac{1}{2}$ D) 1 E) 2

20. $\lim_{x \to -\infty} \frac{5x^2+3x-1}{x^3+2x^2-x} = ?$

A) 0 B) ∞ C) -∞ D) 5 E) Not Exist

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21. $\lim\limits_{n\to\infty}\left(\dfrac{(n+1)(2n-1)}{6n^2-5}\right)=?$

A) 0 B) 2/3 C) 1/4 D) 1/3 E) 1/2

22. $\lim\limits_{x\to\infty}\dfrac{(2x+3)^3.(3x-2)^2}{x^5+5}=?$

A) 16 B) 60 C) 48 D) 36 E) 72

23. $\lim\limits_{x\to-\infty}\dfrac{\sqrt{9x^2+2x+1}}{4x+1}=?$

A) $-\dfrac{3}{4}$ B) $\dfrac{2}{3}$ C) $-\dfrac{2}{3}$ D) 1 E) $\dfrac{3}{4}$

24. (UN 2004)

$\lim\limits_{x\to3}\left(\dfrac{1}{x-3}-\dfrac{6}{x^2-9}\right)=?$

A) $-\dfrac{1}{6}$ B) $\dfrac{1}{6}$ C) $\dfrac{1}{3}$ D) $\dfrac{1}{2}$ E)1

25. (UAN 2003)

$\lim\limits_{x\to\infty}\left((2x+1)-\sqrt{4x^2-3x+6}\right)=?$

A) $\dfrac{3}{4}$ B) 1 C) $\dfrac{7}{4}$ D) 2 E) $\dfrac{5}{2}$

26. $\lim\limits_{x\to\infty}\left(\sqrt{2x^2+2x}-\sqrt{2x^2-3}\right)=?$

A) 0 B) 2 C) $\dfrac{1}{2\sqrt{2}}$ D) $\dfrac{1}{\sqrt{2}}$ E) ∞

27. $\lim\limits_{x\to-\infty}(x+1+\sqrt{x^2+x+1})=?$

A) 1/2 B) −1/2 C) −1 D) 1 E) 0

28. $\lim\limits_{x\to\infty}(\sqrt{x^2+ax+15}-\sqrt{x^2+2x+5})=1\Rightarrow a=?$

A) 4 B) 6 C) 8 D) 10 E) 12

29. $f:R\to R\ ,\ f(x)=\begin{cases}x+1, & x<0\\ a, & x=0\\ x^3+1, & x>0\end{cases}$

If the function f(x) is continuous at the point x=0, what is the value of *a*?

A)1 B)2 C)3 D)4 E)5

30. $f:R\to R\ ,\ f(x)=\begin{cases}\dfrac{ax+2}{x}, & x<2\\ ax-1, & x\geq 2\end{cases}$

If the function f(x) is continuous at the point x=2, what is the value of *a*?

A)1 B)2 C)3 D)4 E)5

Active Note Book