

اختبر نفسك (3)
Check yourself (3)

Mathematics الرياضيات

الصف الثاني عشر متقدم

الفصل الأول T1

2025-2026

مراجعة الدرس الثالث (الجزء الثاني)

Lesson 2-3

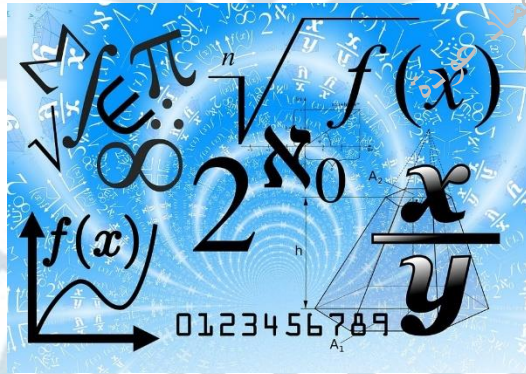
COMPUTATION OF LIMITS

حساب النهايات

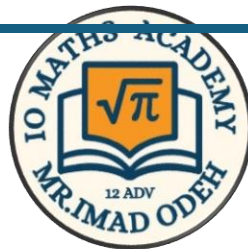
من الوحدة الثانية اعتمادا على الاختبارات السابقة

According to the previous exam

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<https://t.me/lomaths12>

<http://www.youtube.com/@imaths2022>

Q1 Evaluate

اوجد قيمة

$$\lim_{x \rightarrow 1} \frac{|x - 1|}{1 - x}$$

A) -2

B) 1

C) -1

D) Does not exist

Q2 Evaluate

اوجد قيمة

$$\lim_{x \rightarrow 2^+} \frac{x - 2}{|x - 2|}$$

A) -2

B) 1

C) -1

D) Does not exist

Q3 Evaluate

اوجد قيمة

$$\lim_{x \rightarrow -1^+} \frac{|x + 1|}{x^2 - 1}$$

A) -1

B) $-\frac{1}{2}$ C) $\frac{1}{2}$

D) 1

Q4 Evaluate

اوجد قيمة

$$\lim_{x \rightarrow 2} \frac{x - 2}{|x - 2|}$$

A) -2

B) 0

C) -1

D) Does not exist

Q5 Evaluate

اوجد قيمة

$$\lim_{x \rightarrow 0^-} \left(\frac{2}{x} - \frac{2}{|x|} \right)$$

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Imad Odeh

A) 0

B) 1

C) 2

D) Does not exist

Q6 Evaluate

س24 اوجد قيمة

$$\lim_{x \rightarrow 0} \frac{2x - |x|}{|3x| - 2x}$$

- A) $\frac{2}{5}$
 B) $\frac{1}{5}$
 C) $-\frac{3}{5}$
 D) Does not exist

Q7 Evaluate

اوجد قيمة

$$\lim_{x \rightarrow 0} \frac{x^2 + x}{\sqrt{x^4 + 2x^2}}$$

- A) 0
 B) $\frac{1}{\sqrt{2}}$
 C) $-\frac{1}{\sqrt{2}}$
 D) Does not exist

Q8 Let

لتكن

$$f(x) = \begin{cases} x^2 + 2 \cos x + 1, & x < 0 \\ e^x - 4, & x \geq 0 \end{cases}$$

Find

اوجد قيمة

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

- A) -3
 B) 3
 C) 0
 D) does not exist

Q9 Let

لتكن

$$f(x) = \begin{cases} 2x + 1, & x < -1 \\ 3, & -1 < x < 1 \\ 2x + 1, & x \geq 1 \end{cases}$$

Find

اوجد قيمة

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

- A) -3
 B) 3
 C) 1
 D) does not exist

Q10 Let

لنكن

$$f(x) = \begin{cases} 2x^2 + x & , \quad x < -1 \\ \sqrt{3-x} & , \quad -1 < x < 1 \\ 2x + 1 & , \quad x \geq 1 \end{cases}$$

Find

اوجد قيمة

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Imad Odeh

- A) 4
B) $\sqrt{2}$
C) 2
D) **does not exist**

Q11 Let

لنكن

$$f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & , \quad x < 3 \\ 2x + b & , \quad x \geq 3 \end{cases}$$

Find the value of b such that

اوجد قيمة

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$$b = 0$$

Q12 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\sin 3x}{2x}$$

- A) 1
B) 3
C) **$\frac{3}{2}$**
D) does not exist

Q13 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\tan x}{5x}$$

- A) 5
B) 0
C) **$\frac{1}{5}$**
D) does not exist

Q14 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\sin 2x}{\tan 3x}$$

- A) 1
 B) 2
 C) 3
 D) does not exist

Q15 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{2x}{\tan x}$$

- A) 2
 B) 1
 C) 0
 D) does not exist

Q16 Evaluate

اوجد

$$\lim_{x \rightarrow 0} x^2 \csc^2 x =$$

- A) 1
 B) 2
 C) 0
 D) Does not exist

Q17 Evaluate

اوجد

$$\lim_{x \rightarrow 0} (x \cot x)$$

- A) 1
 B) -1
 C) 0
 D) Does not exist

Q18 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \left(\frac{xe^x}{\tan x} \right)$$

- A) 1
 B) -1
 C) 0
 D) Does not exist

Q19 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{x \sin 3x}{\sin^2 5x}$$

- A) $\frac{3}{5}$
 B) $\frac{3}{25}$
 C) 0
 D) Does not exist

Q20 Evaluate

اوجد

$$\lim_{\theta \rightarrow 0} \frac{\theta + \theta \cos \theta}{\sin \theta \cos \theta}$$

- A) $\frac{1}{4}$
 B) 1
 C) $\frac{1}{2}$
 D) 2

Q21 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\sin |x|}{x}$$

- A) 1
 B) -1
 C) 2
 D) does not exist

Q22 find value of k if

اوجد قيمة k

$$\lim_{x \rightarrow 0} \frac{\sin kx}{3x} = 2$$

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

Q23 evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{1 - \cos^2 x}{x^2}$$

- A) 2
 B) 1
 C) 0
 D) Does not exist

Q24 evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{x^2}{\cos^2 x - 1}$$

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Imad Odeh

Imad Odeh

Imad Odeh

- A) **-1**
 B) 1
 C) 0
 D) Does not exist

Q25 evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\cos^2 x - 1}{2x^2}$$

Imad Odeh

Imad Odeh

Imad Odeh

Imad Odeh

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

Q26 evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\cos x - 1}{x \sin x}$$

A) **$\frac{1}{2}$**

- B) $-\frac{1}{2}$
 C) 0
 D) Does not exist

Q27 evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{x \sin x}{1 - \cos x}$$

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Imad Odeh

Imad Odeh

Imad Odeh

- A) $\frac{1}{2}$
 B) **2**
 C) 0
 D) Does not exist

Q28 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\sqrt{\sec^2 x - 1}}{x} =$$

- A) 1
 B) -1
 C) 0
 D) **Does not exist**

Q29 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{x^2}{3 \sec x - 3}$$

- A) $\frac{1}{2}$
 B) $\frac{2}{3}$
 C) $\frac{3}{2}$
 D) Does not exist

Q30 Evaluate

اوجد

$$\lim_{x \rightarrow 0} 6x^2 (\cot x) (\csc 2x)$$

- A) $\frac{1}{2}$
 B) $\frac{1}{3}$
 C) $\frac{3}{2}$
 D) Does not exist

Q31 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \sin x \cot 2x$$

- A) $\frac{1}{2}$
 B) $\frac{1}{3}$
 C) $\frac{2}{3}$
 D) Does not exist

Q32 Evaluate

اوجد

$$\lim_{x \rightarrow \frac{\pi}{3}} \frac{\sin\left(\frac{\pi}{3} - x\right)}{\frac{\pi}{3} - x}$$

- A) -1
 B) 0
 C) $\frac{\sqrt{3}}{2}$
 D) 1

Q33 Evaluate

اوجد

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

- A) 1
 B) 2
 C) $\frac{1}{4}$
 D) does not exist

Q34 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \sin^{-1} \left(\frac{\sqrt{x+3}}{2} \right)$$

- A) $\frac{\pi}{6}$
 B) $\frac{\pi}{3}$
 C) $\frac{\pi}{2}$
 D) Does not exist

Q35 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \sin^{-1} \left(\frac{x+1}{2} \right)$$

- A) $\frac{\pi}{6}$
 B) $\frac{\pi}{3}$
 C) $\frac{\pi}{2}$
 D) Does not exist

Q36 Evaluate

اوجد

$$\lim_{x \rightarrow 0} \cos^{-1}(x^2) =$$

- A) $\frac{\pi}{6}$
 B) $\frac{\pi}{3}$
 C) $\frac{\pi}{2}$
 D) Does not exist

Q37 evaluate

اوجد

$$\lim_{x \rightarrow 0} \frac{\sin x}{1 - \sqrt{1+x}} \cdot \frac{1 + \sqrt{1+x}}{1 + \sqrt{1+x}}$$

$$\lim_{x \rightarrow 0} \frac{\sin x}{1 - (1+x)} \cdot \frac{1 + \sqrt{1+x}}{1 + \sqrt{1+x}}$$

$$\lim_{x \rightarrow 0} \frac{\sin x}{-x} (1 + \sqrt{1+x}) = -1 (1 + \sqrt{1+0}) = -1 (2) = -2$$

Q38 If

لتكن

$$(\sin x + 2x) \leq x f(x) \leq x^2 + 3x$$

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

- A) 1
 B) 0
 C) 3
 D) Does not exist

Q39 if

لتكن

$$|g(x) + 4| \leq 2(2 - x)^2$$

$$\lim_{x \rightarrow 2} g(x)$$

A) -4

B) 0

C) 2

D) 4

Q40 Determine the value of

اوجد قيمة

$$\lim_{x \rightarrow 0} \left[x^2 \cos \left(\frac{1}{x} \right) \right]$$

$$-1 \leq \cos \frac{1}{x} \leq 1$$

$$-x^2 \leq x^2 \cos \frac{1}{x} \leq x^2$$

$$\lim_{x \rightarrow 0} -x^2 \leq \lim_{x \rightarrow 0} x^2 \cos \frac{1}{x} \leq \lim_{x \rightarrow 0} x^2$$

$$0 \leq \lim_{x \rightarrow 0} x^2 \cos \frac{1}{x} \leq 0$$

$$\Rightarrow \lim_{x \rightarrow 0} x^2 \cos \frac{1}{x} = 0$$

Q41 Determine the value of

اوجد قيمة

$$\lim_{x \rightarrow 0^+} \left[\sqrt{x} \sin^2 \left(\frac{1}{x} \right) \right]$$

$$0 \leq \sin^2 \frac{1}{x} \leq 1$$

$$0 \leq \sqrt{x} \sin^2 \frac{1}{x} \leq \sqrt{x}$$

$$\lim_{x \rightarrow 0^+} 0 \leq \lim_{x \rightarrow 0^+} \sqrt{x} \sin^2 \frac{1}{x} \leq \lim_{x \rightarrow 0^+} \sqrt{x}$$

$$0 \leq \lim_{x \rightarrow 0^+} \sqrt{x} \sin^2 \frac{1}{x} \leq 0$$

$$\Rightarrow \lim_{x \rightarrow 0^+} \sqrt{x} \sin^2 \frac{1}{x} = 0$$

Q42 Suppose that

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$$|f(x)| \leq 4$$

Prove that

$$\lim_{x \rightarrow 0} x^2 f(x) = 0$$

اوجد

$$-4 \leq f(x) \leq 4$$

$$-4x^2 \leq x^2 f(x) \leq 4x^2$$

$$\lim_{x \rightarrow 0} -4x^2 \leq \lim_{x \rightarrow 0} x^2 f(x) \leq \lim_{x \rightarrow 0} 4x^2$$

$$0 \leq \lim_{x \rightarrow 0} x^2 f(x) \leq 0$$

$$\Rightarrow \lim_{x \rightarrow 0} x^2 f(x) = 0$$

Q43 if

لتكن

$$\frac{2x^2 - x^3}{2} \leq x^2 f(x) \leq \frac{x^2 + \sin^2 x}{2}$$

Find

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

اوجد

$$\frac{2x^2 - x^3}{2x^2} \leq f(x) \leq \frac{x^2 + \sin^2 x}{2x^2}$$

$$1 - \frac{x}{2} \leq f(x) \leq \frac{1}{2} + \frac{\sin^2 x}{x^2}$$

$$\lim_{x \rightarrow 0} 1 - \frac{x}{2} \leq \lim_{x \rightarrow 0} f(x) \leq \lim_{x \rightarrow 0} \frac{1}{2} + \frac{\sin^2 x}{x^2}$$

$$1 \leq \lim_{x \rightarrow 0} f(x) \leq \frac{1}{2} + \frac{1}{2}$$

$$1 \leq \lim_{x \rightarrow 0} f(x) \leq 1$$

$$\Rightarrow \lim_{x \rightarrow 0} f(x) = 1$$

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Q44 if

لتكن

$$(x^2 - 1)(x^2 + 1) \leq (x - 1)f(x) \leq (x^2 + 2x - 3) \text{ Where } x \neq 1, [-3, 3]$$

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$x-1$

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Imad Odeh

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Find

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

اوجد

$$\frac{(x-1)(x+1)(x^2+1)}{x-1} \leq f(x) \leq \frac{(x+3)(x-1)}{x-1}$$

$$(x+1)(x^2+1) \leq f(x) \leq (x+3)$$

$$\lim_{x \rightarrow 1} (x+1)(x^2+1) \leq \lim_{x \rightarrow 1} f(x) \leq \lim_{x \rightarrow 1} (x+3)$$

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Imad Odeh

Imad Odeh

$$4 \leq \lim_{x \rightarrow 1} f(x) \leq 4 \Rightarrow \lim_{x \rightarrow 1} f(x) = 4$$

Q45

Let

لتكن

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Imad Odeh

$$\frac{1}{32} (x^2 - 16) \leq (x - 4)f(x) \leq \sqrt{x} - 2, \quad x \neq 4$$

Find

$$\lim_{x \rightarrow 4} f(x)$$

اوجد

$$\frac{1}{32} \frac{(x-4)(x+4)}{x-4} \leq f(x) \leq \frac{\sqrt{x}-2}{x-4} \cdot \frac{\sqrt{x}+2}{\sqrt{x}+2}$$

$$\frac{1}{32} (x+4) \leq f(x) \leq \frac{1}{(x-4)(\sqrt{x}+2)}$$

$$\lim_{x \rightarrow 4} \frac{1}{32} (x+4) \leq \lim_{x \rightarrow 4} f(x) \leq \lim_{x \rightarrow 4} \frac{1}{\sqrt{x}+2}$$

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$$\frac{1}{4} \leq \lim_{x \rightarrow 4} f(x) \leq \frac{1}{4} \Rightarrow \lim_{x \rightarrow 4} f(x) = \frac{1}{4}$$

Q46 if

47

$$|g(x) + 4| \leq 2(3 - x)^4 \text{ is true for all value of } x$$

Find

$$\lim_{x \rightarrow 3} g(x)$$

اوجد

$$-2(3-x)^4 \leq g(x) + 4 \leq 2(3-x)^4$$

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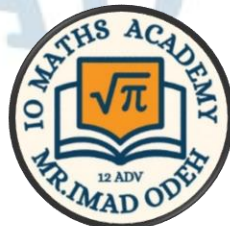
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$$\lim_{x \rightarrow 3} -2(3-x)^4 - 4 \leq \lim_{x \rightarrow 3} g(x) \leq \lim_{x \rightarrow 3} 2(3-x)^4 - 4$$

$$-4 \leq \lim_{x \rightarrow 3} g(x) \leq -4 \Rightarrow \lim_{x \rightarrow 3} g(x) = -4$$



اطيب التمنيات للجميع

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