

اختبر نفسك (8) Check yourself (8)

Mathematics الرياضيات

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الصف الحادي عشر متقدم

T1 الفصل الأول

2026-2027

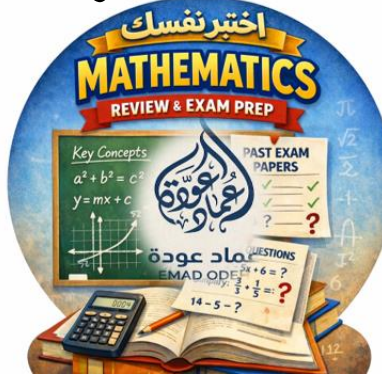
مراجعة الدرس الثالث

Lesson 6-5

Using Exponential and Logarithmic Functions
Module 6 (Logarithmic Functions)

According to the previous exam

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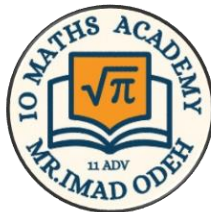


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اسم الطالب: -

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Q1

in 2000, the world population was estimated to be **6.124 billion** people, and in 2005, it reached **6.515 billion**. Which of the following exponential growth models represents the population y (in billions) t years after 2000, and in which year does the population reach **7.5 billion**?

A) $y = 6.124(1.0125)^t$; Year 2016

B) $y = 6.124e^{0.0124t}$; Year 2016

C) $y = 6.124(1.0638)^t$; Year 2012

D) $y = 6.515e^{0.0124t}$; Year 2020

Q2

Alaska ranks as the **48th** state when comparing population sizes. In **1980**, the population was **410,851** and in **2010** the population was **713,985**. Which equation models the population of Alaska t years after 1980?

A) $y = 410,851e^{0.0184t}$

B) $y = 410,851e^{-0.0184t}$

C) $y = 713,985e^{0.0184t}$

D) $y = 713,985e^{-0.0184t}$

Q3

Jason wants to buy a new HD television that currently costs **\$2,500**. The price increases by **4%** each year. He decides to wait and instead deposits **\$2,200** into a savings account that earns **4.7%** annual interest compounded continuously. After approximately how many years will the amount in his savings account exceed the cost of the new television?

A) 4.7 years

B) 11.8 years

C) 18.3 years

D) 25.1 years

Q4 Radioactive substance has a half-life of **32 years**. Which equation models the decay rate k , and how much of a **5-gram** sample remains after **100 years**?

- A) $k \approx 0.0217$; $y \approx 0.57$ g
- B) $k \approx -0.0217$; $y \approx 0.57$ g
- C) $k \approx 0.0217$; $y \approx 1.14$ g
- D) $k \approx -0.0312$; $y \approx 0.22$ g

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Q5 Carbon-14 has a decay constant $k = 0.00012$. What is the approximate age of a fossil that has **lost 95%** of its original Carbon-14?

- A) 427 years
- B) 2,496 years
- C) 24,964 years
- D) 29,957 years

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Q6 Archeologists analyze an ancient wooden tool and find that it contains **22%** of its original Carbon-14. Given that the decay constant of Carbon-14 is $k = 0.00012$, about how old is the artifact?

- A) 1,833 years
- B) 6,833 years
- C) 12,618 years
- D) 18,333 years

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Q1

Satellites in space are powered by radioisotopes, or radioactive elements. The amount of power the radioisotope generates over time can be represented by the equation $P = 53e^{-0.0042t}$, where P is the output in watts and t is the time in days. After how many days will the remaining power be 11.44 watts? Round to the nearest whole number.

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Q2

The half-life of Rubidium-87 is about 48.8 billion years.

a. Determine the value of k and the equation of decay for Rubidium-87 .

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b. A specimen currently contains 50 milligrams of Rubidium-87 . How long will it take the specimen to decay to only 18 milligrams of Rubidium-87?

c. How many milligrams of the 50-milligram sample will be left after 800 million years?

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d. How long will it take Rubidium-87 to decay to one-sixteenth its original amount?

اطيب التمنيات



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