

Grade 12 general -Term one: Revision of unit three-2024/2025

(Exponential and Logarithmic Functions) / Done by Moh'D Alzzen

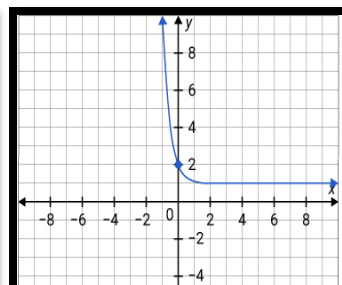
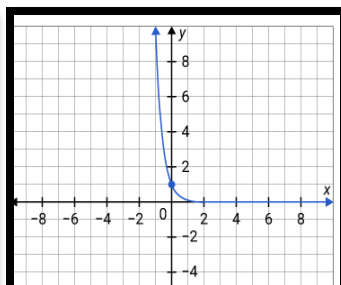
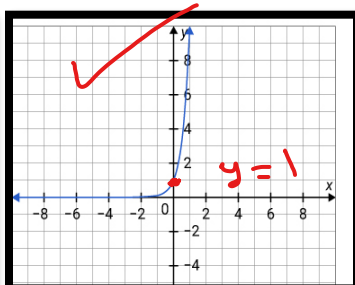
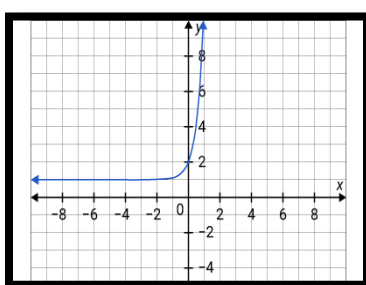
Q(1). One of the following is exponential decay function:

- a) $y = e^x$ b) $y = (\frac{3}{2})^x$ (c) $y = (\frac{3}{5})^x$ d) $y = 5^x$
- growth* *1.5 growth* *0.6 decay* *growth*

Q(2). Which of the following is logarithm decay function:

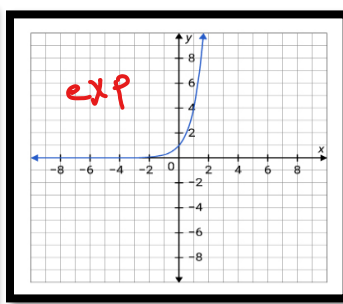
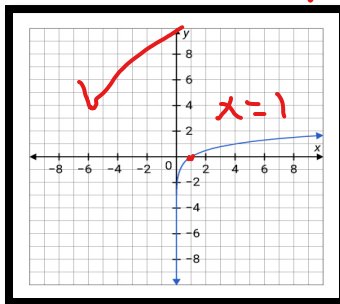
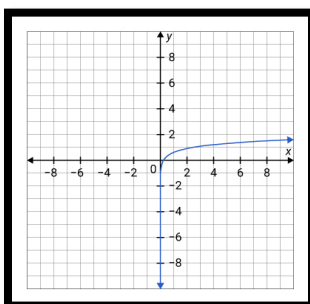
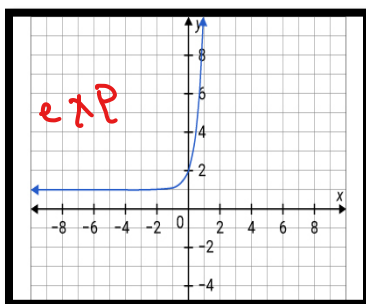
- a) $f(x) = \ln x$ b) $g(x) = \log x$ c) $f(x) = \log_5 x$ (d) $f(x) = \log_{0.7} x$
- growth* *growth* *growth* *decay*

Q(3). Which of the following graph represent the function $f(x) = 10^x$ *y-int = 1* *= growth*



Q(4). Which of the following graph represent the function $f(x) = \log_4 x$

x-int = 1 *growth*



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Q(5). Complete the following table below : $e = 2.71 \dots$

	$g(x) = (0.5)^x - 2$	$f(x) = e^x + 3$	$f(x) = \log_{0.25} x$	$f(x) = \log(x - 3)$
Growth or decay	<i>decay</i>	<i>growth</i>	<i>decay</i>	<i>growth</i>
Domain	$(-\infty, \infty)$	$(-\infty, \infty)$	$(0, \infty)$	$(3, \infty)$
Range	$(-2, \infty)$	$(3, \infty)$	$(-\infty, \infty)$	$(-\infty, \infty)$
Y-Intercept	$y = -1$	$y = 4$		
X-Intercept			$x = 1$	$x = 4$
Axis of asymptote	$H.A: y = -2$	$H.A: y = 3$	$V.A: x = 0$	$V.A: x = 3$

Q(6). The student population at a local school is 475 and is growing at an annual rate of 3% . Predict the student population in 5 years , Round to the nearest student.

❖ يبلغ عدد الطلاب في مدرسة محلية 475 طالبًا وينمو بمعدل سنوي قدره 3%. توقع عدد الطلاب في 5 سنوات، قرّب لأقرب طالب.

$$N = N_0 (1 + r)^t = 475 (1 + 0.03)^5 = 550.6 \approx \boxed{551}$$

- (a) 551 b) 555 c) 490 d) 560

Q(7). A car is initially bought for AED 40,000, The value of the car falls at an annual rate of 8 %. What is the value of the car after 5 years? Round to the nearest AED?

❖ تم شراء السيارة مبدئيًا بمبلغ 40,000 درهم إماراتي، تنخفض قيمة السيارة بمعدل سنوي 8%. ما هي قيمة السيارة بعد 5 سنوات؟ قرّب إجاباتك إلى أقرب درهم إماراتي

- a) 58773 b) 35245 (c) 26363 d) 27142

$$N = 40,000 (1 - 0.08)^5 = \boxed{26363}$$

Q(8). Evaluate each expression :

a) $\log_7 \frac{1}{49} = \dots -2 \dots$ b) $12^{\log_{12} 3.2} = \dots 3.2 \dots$

c) $\log 0.001 = \dots -3 \dots$ d) $\log 10000 = \dots 4 \dots$

f) $\ln e^{36} = \dots 36 \dots$ g) $e^{\ln 8} = \dots 8 \dots$ h) $\log_4 \sqrt[5]{64} = \dots \frac{3}{5} \dots$

Q(9) : When you rewrite the express **log 40** in terms of **log 2** and **log 5**.

a) $2\log 2 + 2\log 5$ $\log 2^3 + \log 5$ b) $3\log 2 + 2\log 5$ $\log 2^3 + \log 5$
 c) $3\log 2 + \log 5$ $= 3\log 2 + \log 5$ d) $3\log 2 - \log 5$ $\log 2^3 - \log 5$

Q(10). Expand the expression $\ln \frac{\sqrt{x}}{3x^2} = \ln x^{\frac{1}{2}} - \ln 3 - \ln x^2$

a) $\frac{1}{2} \ln(x) - \ln 3 + 2 \ln x$ (b) $\frac{1}{2} \ln(x) - \ln 3 - 2 \ln x$ $= \frac{1}{2} \ln x - \ln 3 - 2 \ln x$
 c) $\frac{1}{2} \ln(x) - 2 \ln 3 + 2 \ln x$ d) $\frac{1}{2} \ln(x) - 2 \ln 3 + 2 \ln x$ $= \frac{1}{2} \ln x - \ln 3 - 2 \ln x$

بوجردل آخر
 Simplify

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Q(11). Condensed the expression: $3 \log_3 x - 2 \log_3 y = \log_3 x^3 - \log_3 y^2$

- a) $\log_3 \frac{x^3}{y^2}$ b) $\log_3 \frac{y^3}{x^2}$ c) $\log_3 \frac{3x}{2y}$ d) $\frac{3}{2} \log_3 \frac{x}{y}$

Q(12). Which logarithmic expression is equivalent to $\log_2 35 = \frac{\log_3 35}{\log_2 35}$

- a) $\frac{\log 2}{\log 35}$ b) $\frac{\log 35}{\log 2}$ c) $\log 35 - \log 2$ d) $\log 35 + \log 2$

Q(13). What is the value of $\log_8 341$, rounded to the nearest thousandth?

- a) 3.346 b) 0.345 c) 1.632 d) 2.805

Q(14). Determine the solution to the equation $121^{x-2} = 11^4$

- a) 4 b) 0 c) -4 d) 11

Q(15). Solve $e^{2x} + 5e^x - 24 = 0 \Rightarrow x = \ln 3 \checkmark = 1.1$
 mode (5) $\rightarrow$ (3) $x = \ln(-5) \times$

- a) $\ln 3$ b) $\ln 4$ c) $\ln 6$ d) $\ln 8$

Q(16). Solve $2 \log_6 x = 1 - \log_6 (x + 5)$.

- a) 3 b) 4 c) 1 d) 5

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D: (7, ∞) $\Rightarrow x = 7$

Q(17). The vertical asymptote of $f(x) = \log_4 (x - 7) + 3$ is :

- a) $x = 7$ b) $x = -7$ c) $y = 3$ d) $y = 0$

Range (4, ∞) $\Rightarrow y = 4$

Q(18). The horizontal asymptote of $y = 5^{x-1} + 4$ is:

- a) $y = -4$ b) $x = -1$ c) $x = 1$ d) $y = 4$

Q(19). Use the exponential of $f(x) = -(3)^{x-5} + 7$

to describe the **transformation** (صف التحويلات الهندسية للدالة).

- ① Reflection across x-axis.
- ② translate 5 units right.
- ③ // 7 units up.

* $g(x) = -a(3)^{x-h} + k$

Diagram showing transformations: x -axis, y -axis, $a > 1$, $0 < a < 1$, $x \pm h$, $\pm k$, Exp. Vert comp. =

Q(20). Use the logarithm function of $f(x) = -2 \log_2(x + 4) - 9$

to describe the **transformation** (صف التحويلات الهندسية للدالة).

- ① Reflection across x-axis
- ② vertical expanded by Factor 2.
- ③ Translate 4 units Left.
- ④ = 9 = down.

Q(21). Mohammed invests AED 950 in an account with a 4% Interest rate, making no other deposits or withdrawals. What will Mohammed's account balance be after 10 years if the Interest is compounded **monthly**?

❖ يستثمر محمد 950 درهماً إماراتياً في حساب بفائدة 4% ، ولا يقوم بأي إيداعات أو عمليات سحب أخرى. ماذا سيكون رصيد حساب محمد بعد 10 سنوات إذا تم مضاعفة الفائدة شهرياً ؟

$$A = p \left(1 + \frac{r}{n}\right)^{nt} = 950 \left(1 + \frac{0.04}{12}\right)^{12 \times 10} = 1416.3$$

ملامح

monthly $n=12$ daily $n=365$	Semiannually $n=2$ Quarterly $n=4$	annually $n=1$
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Q(22). Suppose Jaber finds an account that will allow him to invest his AED 5000 at a 6% interest rate compounded **continuously**. If there are no other deposits or withdrawals, what will Jaber's account balance be after 10 years? Round the account balance to the nearest AED.

● لنفترض أن جابر وجد حساباً يسمح له باستثمار 5000 درهم بنسبة مرابحة مركبة مستمرة 6% ولا يقوم بأيّ إيداع أو سحبوات أخرى. ماذا سيكون رصيد حساب جابر بعد 10 سنوات ؟ قرّب رصيد حساب جابر لأقرب درهم.

$$A = p e^{r \cdot t} = 5000 e^{0.06 \times 10} = 9110.5$$