# XT - MATHS Grade 12

**Name:** _____ **Class:** _____

**Subject:** Inverses and Logarithms **Date:** _____

**Total Marks:** 66

---

**Question 1: True/False [8]** Mathematics - LO 1 : AS 2

If $\log_3(5 - x) = 2 - \log_3(1 + x)$, then $x = \pm 2$.

**TRUE** **FALSE**

---

**Question 2: True/False [2]** Mathematics - LO 1 : AS 2

$\frac{\log x}{\log y} = \log \frac{x}{y}$

**TRUE** **FALSE**

---

**Question 3: Multiple Choice [6]** Mathematics - LO 1 : AS 2

Simplify:

$$\frac{\log_2 9 - \log_2 3 + \log_2 27}{\log_2 81 - \log_2 27} = \ldots$$

**A** $3$

**B** $\frac{1}{4}$

**C** $4$

**D** $\frac{1}{\log_2 3}$

---

**Question 4: Multiple Choice [4]** Mathematics - LO 1 : AS 2

$\frac{\log_3 27}{\log_3 81} = \ldots$

**A** $-1$

**B** $\frac{27}{81} = \frac{1}{3}$

**C** $\frac{3}{4}$

**D** $\log_3 54$

**Question 5: Socrates [4]** Mathematics - LO 1 : AS 2

If the graph of $y = \log_a x$ passes through the point $(\frac{1}{27}; -3)$, then the value of $a$ is ...

Type the number only.

**Question 6: Socrates [2]** Mathematics - LO 1 : AS 2

$\log_8 (\log 10) =$ ...

Type the number only.

**Question 7: Socrates [6]** Mathematics - LO 1 : AS 2

Solve for $x$:

$$\log_x 54 + \log_x 5 - \log_x 10 = 1\frac{1}{2}$$

$$\therefore x = \text{...}$$

**Question 8: Cloze [4]** Mathematics - LO 1 : AS 2

Complete the following process of solving for $x$:

$$\log x^2 = 2$$

$$\therefore x^2 = \text{(Ans. 1)}$$

$$\therefore x = \text{(Ans. 2)}$$

According to definition, $x$ may be equal to (Ans. 3).

| 1 | | 2 | |
|---|---|---|---|
| 3 | | | |

- $2$
- $-10$
- $\pm 10$
- $2^{10}$
- $10$ only
- $100$

**Question 9: Cloze [6]** Mathematics - LO 1 : AS 2

$$\frac{\log x}{\log 4} = 1\frac{1}{2}$$

This equation will be undefined if (Ans. 1).
The solution of this equation is (Ans. 2).

| 1 | | 2 | |
|---|---|---|---|

- $x > 0$
- $x < 0$
- $x \leq 0$
- $x = 0$
- $x = 8$
- $x = \pm 8$
- $x = 32$
- $x = 6$

**Question 10: Cloze [6]** Mathematics - LO 1 : AS 2

$\log_2 y^3 = 6$

According to defintion, $y$ must be (Ans. 1) in this equation.

Complete the following process of solving for $y$:

$$\log_2 y^3 = 6$$

$$\therefore y^3 = \text{(Ans. 2)}$$

$$\therefore y = \text{(Ans. 3)}$$

| | |
|---|---|
| 1 | |
| 2 | |
| 3 | |

- larger than 0
- larger or equal to than 0
- smaller than 0
- $2^6$
- $6^2$
- 4
- 2

**Question 11: Socrates [6]** Mathematics - LO 1 : AS 2

If $7^x \times 5^{x+2} = 263$, then $x$ = ...

Give your answer correct to two decimal digits.

**Question 12: Multiple Choice [4]** Mathematics - LO 1 : AS 2

$\log_3 \frac{a^3 b^2}{x^2}$

When this expression is expanded (that is, written as separate logarithms), the answer will be …

**A** $3\log_3 a + 2\log_3 b - 2\log_3 x$

**B** $\log_3 3 + \log_3 a + \log_3 b - \log_3 x$

**C** $6\log_3 ab - 2\log_3 x$

**D** $\log_3 3a + \log_3 b - \log_3 x$

**Question 13: True/False [2]** Mathematics - LO 1 : AS 2

$\log_2 x = -3$

When solving for $x$ in the above equation, $x$ will be equal to $\frac{1}{8}$.

**TRUE** **FALSE**

**Question 14: True/False [4]**

Mathematics - LO 1 : AS 2

$\log m^2 + 3\log m - \log 5m$

This expression written as a single logarithm:

$$\log \frac{m^5}{5m}$$

**TRUE** | **FALSE**

**Question 15: Socrates [2]**

Mathematics - LO 1 : AS 2

Solve for $x$ without using a calculator:

$$\log_3 27 = x$$

$$\therefore x = \ldots$$

15 Questions, 4 Pages