ALBERTA MATH 30-1 · 25 QUESTIONS

Exponential & Logarithmic Functions — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The logarithmic form of the equation $4^{3/2} = 8$ is**

- **A** $\log_4 8 = \frac{3}{2}$
- **B** $\log_8 4 = \frac{3}{2}$
- **C** $\log_4 \frac{3}{2} = 8$
- **D** $\log_8 \frac{3}{2} = 4$

Understand It with Pulse | Flag a mistake

2 The value of $\log_5\left(\frac{1}{125}\right)$ is

A 3

B -3

C $-\frac{1}{3}$

D $\frac{1}{3}$

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3 The expression $\log_5\left(\frac{25a^2}{b}\right)$, where a, b > 0, expanded fully, is

A $25 + 2\log_5 a - \log_5 b$

B $2 + 2\log_5 a - \log_5 b$

C $2 + \log_5 a - \log_5 b$

D $2 + 2\log_5 a + \log_5 b$

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4 **The solution to the equation $3^{x+1} = 27^{x-2}$ is**

- **A** $\frac{5}{2}$
- **B** 3
- **C** $\frac{7}{2}$
- **D** $-\frac{5}{2}$

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5 **The graph below shows an exponential function. The equation of the horizontal asymptote of the graph is**

- **A** y = 1
- **B** y = 3
- **C** y = 0
- **D** x = 3

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6 The expression $\log x + 2\log y - \frac{1}{3}\log z$, where $x, y, z > 0$, written as a single logarithm, is

- **A** $\log\left(\frac{2xy}{3z}\right)$
- **B** $\log(xy^2 z^{1/3})$
- **C** $\log\left(\frac{xy^2}{z^3}\right)$
- **D** $\log\left(\frac{xy^2}{z^{1/3}}\right)$

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7 The value of $\frac{\log_4 9}{\log_4 3}$ is

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

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8 **The solution to the equation $\log_2 x + \log_2(x - 2) = 3$ is**

- **A** x = -2
- **B** x = 4 and x = -2
- **C** x = 4
- **D** x = 8

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9 **The graph below shows the number of bacteria in a culture over time. The number of bacteria after 15 hours is**

- **A** 16 000
- **B** 8 000
- **C** 2 500
- **D** 32 000

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10 **The graph below shows a logarithmic function. The equation of the vertical asymptote of the graph is**

- **A** x = 2
- **B** x = 0
- **C** x = -1
- **D** x = -2

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11 **If $\log_2 3 = a$ and $\log_2 5 = b$, then $\log_2(\frac{45}{8})$ expressed in terms of a and b is**

- **A** 2a + b - 3
- **B** 2a + b + 3
- **C** a + 2b - 3
- **D** ab - 3

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12 **If $\log_5(3x - 2) = 2$, then the value of x is**

ANSWER _____

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13 **The graph below shows the mass of a radioactive substance over time. The mass, in milligrams, remaining after 24 days is**

ANSWER _____

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14 **An earthquake with a magnitude of 7.4 on the Richter scale is how many times more intense than an earthquake with a magnitude of 5.4?**

A 2

B 20

C 100

D 1 000

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15 The solutions to the equation $2^{2x} - 9(2^x) + 8 = 0$ are

- **A** x = 1 and x = 8
- **B** x = 0 and x = 3
- **C** x = 3 only
- **D** x = 0 and x = 8

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16 An investment earns interest at a rate of 6% per year, compounded annually. The number of years, to the nearest tenth, that it takes for the investment to double in value is

ANSWER _____

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17 A solution has a hydronium ion concentration of 3.2×10^{-5} mol/L. The pH of the solution, to the nearest tenth, is

- A 3.5
- B 5.5
- C -4.5
- D 4.5

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18 The graph of $y = \log_2 x$ is transformed to the graph of $y = -\log_2(x - 1) + 3$. The x-intercept of the transformed graph is

ANSWER _____

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19 The value of $\log_8 32$, to the nearest tenth, is

ANSWER _____

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20 The loudness of a sound, in decibels, is given by $L = 10\log\left(\frac{I}{10^{-12}}\right)$, where I is the intensity of the sound in W/m². The loudness of a sound with an intensity of 10^{-3} W/m² is

A 90 dB

B 30 dB

C 9 dB

D 120 dB

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21 The diagram below shows a logarithmic function. The domain of the function is

A $x \geq 4$

B $x > 4$

C $x > -4$

D $x < 4$

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22 **If $\log_2 x + \log_2(x - 6) = 4$, then the value of x is**

ANSWER _____

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23 **Carbon-14 has a half-life of 5 730 years. A fossil contains 25% of its original carbon-14. The age of the fossil, in years, is**

A 5 730

B 2 865

C 11 460

D 17 190

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24 **The expression $\log_a b + 4\log_a(ac) - 4$, where a, b, c > 1, written as a single logarithm, is**

A $\log_a\left(\frac{bc^4}{4}\right)$

B $\log_a(b^4\ c^4)$

C $\log_a(4bc)$

D $\log_a(bc^4)$

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25 **If $3^{2x-1} = 7$, then the value of x, to the nearest hundredth, is**

ANSWER _____

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ANSWER KEY

1.	A	**10.**	D	**19.**	1.7
2.	B	**11.**	A	**20.**	A
3.	B	**12.**	9	**21.**	B
4.	C	**13.**	5	**22.**	8
5.	A	**14.**	C	**23.**	C
6.	D	**15.**	B	**24.**	D
7.	B	**16.**	11.9	**25.**	1.39
8.	C	**17.**	D		
9.	A	**18.**	9		

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