ILLINOIS ALGEBRA 2 · UNIT 3 · 25 QUESTIONS

# Exponential, Logarithmic, and Trigonometric 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 value of $3^4$ is**

- A 81
- B 64
- C 27
- D 12

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2 **The value of $\log_3 81$ is**

A 9

B 4

C 27

D 3

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3 **The value of $\log_2 (8 \cdot 4)$ is**

ANSWER _____

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**4** **An expanded form of $\log(x^2 y)$ is**

- **A** $2\log x - \log y$
- **B** $\log x \cdot \log y$
- **C** $2\log x + \log y$
- **D** $\log x + 2\log y$

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**5** **The expression $2\log x - \log y$ is equivalent to**

- **A** $\log(2x - y)$
- **B** $\log(x^2 + y)$
- **C** $\log\left(\frac{x^2}{y}\right)$
- **D** $\log\left(\frac{x}{y^2}\right)$

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**6** The solution of $\log_2 x = 4$ is

- A 8
- B 16
- C 2
- D 64

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**7** The solution of $2^x = 64$ is

- A 6
- B 32
- C 5
- D 8

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8 **A population of 500 rabbits doubles every year. After 3 years, the population is**



ANSWER

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**9** **A sample of 800 grams has a half-life of 10 years. After 20 years, the mass remaining, in grams, is**

- **A** 100
- **B** 600
- **C** 400
- **D** 200

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**10** **The exact value of $\sin(\frac{\pi}{6})$ is**

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

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**11** The exact value of $\cos(\frac{\pi}{3})$ is

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

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**12** The exact value of $\tan(\frac{\pi}{4})$ is

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

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**13** **An angle of 120°, in radians, is**

A $\frac{3\pi}{4}$

B $\frac{\pi}{3}$

C $\frac{2\pi}{3}$

D $\frac{5\pi}{6}$

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**14** **A slice of pizza is a sector with radius 6 and central angle 2 radians. Its arc length is**



A 36

B 3

C 8

D 12

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**15** The period of y = sin(2x) is

- A 2π
- B π
- C π/2
- D 4π

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**16** The amplitude of y = 3cos x + 1 is

- A 4
- B 3
- C 2
- D 1

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**17** For y = 2sin x, the amplitude of the function is

A 3

B π

C 1

D 2

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**18** Using $\sin^2 x + \cos^2 x = 1$, an expression for $\sin^2 x$ is

A $\frac{1}{\cos^2 x}$

B $1 + \cos^2 x$

C $\cos^2 x - 1$

D $1 - \cos^2 x$

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**19** The number of solutions of $\sin x = \frac{1}{2}$ on $0 \leq x < 2\pi$ is

ANSWER _____

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**20** The smallest positive solution of $2\cos x - 1 = 0$ is

A $\frac{\pi}{6}$

B $\frac{\pi}{3}$

C $\frac{2\pi}{3}$

D $\frac{5\pi}{6}$

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21 **The solution of log x + log(x - 1) = log 6, for x > 1, is**

A x = -2

B x = 3

C x = 6

D x = 2

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22 **A car worth 20000 dollars loses 10% of its value each year. After 2 years, its value, in dollars, is**



ANSWER

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**23** The value of $\ln e^3$ is

A 3

B 1

C e

D $e^3$

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**24** The value of $\log_5 125$ is

A 15

B 25

C 5

D 3

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25 **If $\sin\theta < 0$ and $\cos\theta > 0$, then $\theta$ is in Quadrant**

A I

B II

C III

D IV

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# ANSWER KEY

1. A
2. B
3. 5
4. C
5. C
6. B
7. A
8. 4000
9. D
10. C
11. A
12. C
13. C
14. D
15. B
16. B
17. D
18. D
19. 2
20. B
21. B
22. 16200
23. A
24. D
25. D

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