

Exponential Functions & Logarithm- Supplement Solution Set

See If You Need This Video!

1. Answer: E

1. $2^3 = 2 \times 2 \times 2$

2. $4^{0.25} = \sqrt[4]{4}$

3. Negative index means putting it at denominator.

4. By $a^b \times a^c = a^{b+c}$

«List of rules of exponential functions»

Cantonese: 0:44 English: 0:41 Putonghua: 0:50

2. Answer: E

1. Because $a^0 = 1$, for all a .

2. 10^x can never be negative if x is real number.

3. $3^2 = 9$

4. $4^{0.5} = 2$

«Basic idea of logarithm and rules of exponential functions»

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3. Answer: A

1. By $\log_a b + \log_a c = \log_a (b + c)$
2. The identity above is invalid for logarithm with different bases.
3. The addition or subtraction cannot penetrate the logarithm operation.

«Addition and subtraction operation of logarithms»

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4. Answer: A

1. By $A \log B = \log B^A$
2. From the above identity you know it is wrong.
3. As 2, it is generally hard to simplify the product of two. logarithms.
4. As 3.

«Multiplication and division involving logarithm»

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5. Answer: B

We change the base of logarithm to something else here. By

$$\log_A C = \frac{\log_B C}{\log_B A}$$

Only choice B is correct.

«Changing base of logarithm»

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6. Answer: C

All the five curves are log – log plot. Let's take logarithm to the equation first.

$$\begin{aligned}\log y &= \log (3x^{-2}) \\ &= \log 3 + \log x^{-2} \\ &= \log 3 - 2 \log x\end{aligned}$$

No matter what base the logarithm is, the relation looks like this. Then if we plot $\log y$ against $\log x$, it should be a straight line, and its slope is -2 here.

So we get the answer, this technique helps treating experimental data very much in studying physics.

«Log-log plot»

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7. Answer: C

1. Yes, it is.

2. $e = \sum_{n=0}^{\infty} \frac{1}{n!}$, it is an irrational number.

3. It is very important to have a sense that it is larger than one, for observing the tendency of exponential decay or grow.

4. NO!!! Natural numbers are non-negative integers (some says it should not include 0). e is called Euler's number.

«Some knowledge about Euler's number»

Cantonese: 3:50 English: 3:12 Putonghua: 4:05