

A2.A.27: Exponential Equations 5: Solve exponential equations with and without common bases

1 If $7^x = 3$, then x is equal to

1) $(\log 3)(\log 7)$

3) $\frac{\log 3}{\log 7}$

2) $\log 3 - \log 7$

4) $\frac{\log 7}{\log 3}$

2 Using logarithms, solve the equation $3^{2x} = 4$ for x to the *nearest tenth*.

3 Using logarithms, solve the equation $(1.95)^x = 54$ for x to the *nearest integer*.

4 Using logarithms, solve the equation $5^x = 17$ for x to the *nearest tenth*.

5 Using logarithms, solve the equation $2^{3x} = 7$ for x to the *nearest tenth*.

6 Using logarithms, find x to the *nearest tenth*: $3^{2x} = 5$

7 Using logarithms, find x , to the *nearest hundredth*: $2^x = 5$

8 Using logarithms, find x to the *nearest tenth*: $3^{2x} = 100$

9 Solve for x to the *nearest tenth*: $5^{3x} = 1,000$

10 Solve for x to the *nearest tenth*. $5^x = 30$

11 Solve for x to the *nearest hundredth*: $6^x = 45$

12 Solve for x to the *nearest hundredth*: $2^x = \frac{3}{16}$

13 Find x to the *nearest hundredth*: $3^x = 6$

14 Using logarithms, find w to the *nearest hundredth*: $5^{2w} + 9 = 40$

15 Solve for x to the *nearest hundredth*. $2^x = 28$

16 What is the value of x in the equation $3^x = 148$, expressed to the *nearest hundredth*?

17 Given: $y = 4.1^x$
Find x , to the *nearest tenth*, when $y = 26$.

18 Using logarithms, solve for x to the *nearest hundredth*: $5^x = 1,325$

19 Solve $e^{4x} = 12$ algebraically for x , rounded to the *nearest hundredth*.

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Answer Section

1 ANS: 3

$$7^x = 3$$

$$\log 7^x = \log 3$$

$$x \log 7 = \log 3$$

$$x = \frac{\log 3}{\log 7}$$

REF: 061009b

2 ANS:

0.6

REF: 068038siii

3 ANS:

6

REF: 088437siii

4 ANS:

1.8

REF: 088536siii

5 ANS:

0.9

REF: 068636siii

6 ANS:

0.7

REF: 089438siii

7 ANS:

2.32

REF: 069542siii

8 ANS:

2.1

REF: 089542siii

9 ANS:

1.4

REF: 069641siii

10 ANS:

2.1

REF: 019737siii

11 ANS:
2.12

REF: 089739siii

12 ANS:
-2.42

REF: 089839siii

13 ANS:
1.63

REF: 019939siii

14 ANS:
1.07

REF: 010041siii

15 ANS:
4.81

REF: 010141siii

16 ANS:
4.55

REF: 060109siii

17 ANS:
2.3

REF: 010240siii

18 ANS:
4.47

REF: 080339siii

19 ANS:
 $\ln e^{4x} = \ln 12$
 $4x = \ln 12$
 $x = \frac{\ln 12}{4}$
 ≈ 0.62

REF: 011530a2