

AP Calculus
Exponential and Logarithmic Properties

Name _____

Date _____

Solve.

1. Which of the following is equal to $e^{\ln(e^2)}$?

a) e^2

b) e^{e+2}

c) $\frac{e}{2}$

d) $2e$

e) 2^e

2. Find all value(s) for x such that $2 \ln x - \ln \frac{1}{x} = 9$.

a) e

b) $\frac{3}{e}$

c) 3

d) e^2

e) e^3

3. Find all value(s) for x such that $\ln(5x + 1) + \ln x = \ln 4$.

a) -1 and $\frac{4}{5}$

b) $\frac{4}{5}$ only

c) $\frac{3}{5}$ and 4

d) e^4 and $e^{3/5}$

e) 1 and $-\frac{4}{5}$

4. Solve for x : $2^{3x-1} = 5$

a) $\frac{1}{3} \ln 10$

b) $\frac{7}{6}$

c) $\frac{1}{3} [\ln 2.5 + 1]$

d) $\frac{1}{3} \left[\frac{\ln 5}{\ln 2} + 1 \right]$

e) $\frac{1}{3} [1 - \ln 2.5]$

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5. Solve for x : $2^{5x-1} = 3$

a) $\frac{8}{3}$

b) $\frac{1}{5} \ln 6$

c) $\frac{1}{5} \left[\frac{\ln 3}{\ln 2} + 1 \right]$

d) $\frac{1}{5} \left[1 - \ln\left(\frac{2}{3}\right) \right]$

e) $\frac{1}{5} \left[\ln\left(\frac{2}{3}\right) + 1 \right]$

6. $64^{x-4} = \left(\frac{1}{2}\right)^{2x}$

7. $\left(\frac{1}{2}\right)^{y+1} = 4^{3y-4}$

8. $6^{3x-1} = 10$

9. $4^{2y+2} = 40$

10. $27 = 10^{x+4}$

11. $3^{2x} - 11(3^x) + 18 = 0$

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12. $e^{2x+6} = e^{x+4}$

13. $e^{x+1} = 8$

14. $3e^{2x-1} = 12$

15. $\log_x \frac{1}{9} = -2$

16. $\log_4(5x - 1) = 3$

17. $2 = \log_3(t^2 - 3t + 5)$

18. $2 = \log_3(9n + 10) - \log_3(5n)$

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19. $\log_3(x^2 - 9) = 1 + \log_3(x + 3)$

20. $(\log y)^2 = \log(\sqrt[4]{y})$

21. $0 = \ln(4x^2 - 1)$

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1.
 Answer: a
 CodePath: EAS.APC.A.D.13

2.
 Answer: e
 CodePath: EAS.APC.A.D.16

3.
 Answer: b
 CodePath: EAS.APC.A.D.17

4.
 Answer: d
 CodePath: EAS.APC.A.D.21

5.
 Answer: c
 CodePath: EAS.APC.A.D.22

6.
 Answer: $x = 3$
 CodePath: EAS.TRI.K.F.25

7.
 Answer: $y = 1$
 CodePath: EAS.TRI.K.F.27

8.
 Answer: $x = \frac{1+\log 6}{3\log 6} \approx 0.76$
 CodePath: EAS.TRI.K.F.55

9.
 Answer: $y = \frac{1-\log 4}{2\log 4} \approx 0.33$
 CodePath: EAS.TRI.K.F.56

10.
 Answer: $x = -4 + 3\log 3 \approx -2.57$
 CodePath: EAS.TRI.K.F.58

11.
 Answer: $x = 2$
 CodePath: EAS.TRI.K.F.71

12.
 Answer: $x = -2$
 CodePath: EAS.TRI.K.F.74

13.
 Answer: $x = -1 + 3\ln 2 \approx 1.08$
 CodePath: EAS.TRI.K.F.79

14.
 Answer: $x = \frac{1+\ln 4}{2} \approx 1.19$
 CodePath: EAS.TRI.K.F.81

15.
 Answer: $x = 3$
 CodePath: EAS.TRI.K.F.104

16.
 Answer: $x = 13$
 CodePath: EAS.TRI.K.F.125

17.
 Answer: $t = 4, -1$
 CodePath: EAS.TRI.K.F.135

18.
 Answer: $n = \frac{5}{18}$
 CodePath: EAS.TRI.K.F.139

19.
 Answer: $x = 6$
 CodePath: EAS.TRI.K.F.155

20.
 Answer: $y = 1$ or 1.78
 CodePath: EAS.TRI.K.F.173

21.
 Answer: $x = \pm \frac{\sqrt{2}}{2}$
 CodePath: EAS.TRI.K.F.179