

3.4 WS: SOLVING EXPONENTIAL AND LOGARITHMIC EQUATIONS

**SOLVE THE FOLLOWING PROBLEMS.
USE THE QR CODE ON THE LAST PAGE TO
CHECK YOUR ANSWERS.**

SOLVE FOR x .

3) $2(5^x) = 32$

1) Find the time (in years) necessary for an account with an initial investment of \$250 to reach a balance of \$1000 if the account has an annual interest rate of 5% and is compounded quarterly.

4) $6^x + 10 = 47$

2) Find the annual interest rate of an account that is compounded continuously and took 3 years to grow from an initial investment of \$400 to a balance of \$900.

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$$5) e^{5x} = 3000$$

$$7) 6(2^{3x-1}) - 7 = 9$$

$$6) 8(3^{6-x}) = 40$$

$$8) -14 + 3e^{2x-1} = 11$$

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Loudness, L , measured in decibels (dB) is defined by:

$$L = 10 \log I + 120$$

where I is called the intensity of the sound and is measured in watts/meter² (W/m²). The noise level inside a convertible driving along the freeway with its top up is 70 dB. With the top down, the noise level is 95 dB.

9) Find the intensity of the sound with:

a) the top up

SOLVE FOR x . (CHECK FOR EXTRANEIOUS SOLUTIONS)

$$11) \frac{1}{2} \ln 16x = 3$$

$$12) 5 - 2 \log_6 3x = -5$$

b) the top down

10) How many times as intense is the noise level with the top down than with the top up?

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13) $15 + 2 \log_2(2x - 5) = 31$

15) $\log(x - 3) + \log x = 1$

14) $-4 - \log_3 \sqrt{5 - x} = -10$

16) $\log(7x + 1) - \log(x - 2) = 1$

