

Solve each equation.

1. $2^{3x} = 4\sqrt{5}$

$$\log_2(4\sqrt{5}) = 3x$$

$$x = 1.054$$

2. $.3^{4x} + 3 = 24$

$$3^{4x} = 21$$

$$\log_3 21 = 4x$$

$$x = .693$$

3. $4^{2x} - 3 = 24$

$$4^{2x} = 27$$

$$\log_4 27 = 2x$$

$$x = 1.189$$

4. $3^{7x} - 7 = 10$

$$3^{7x} = 17$$

$$\log_3 17 = .7x$$

$$x = 3.684$$

5. $11 \cdot 6^x = 12$

$$6^x = \frac{12}{11}$$

$$\log_6 \left(\frac{12}{11}\right) = x$$

$$.049 = x$$

6. $18 \cdot 5^{-3x} = .007$

$$5^{-3x} = \frac{.007}{18}$$

$$\log_5 \left(\frac{.007}{18}\right) = -3x$$

$$x = 16.26$$

7. $2^{2x} + 3 = 8$

$$2^{2x} = 5$$

$$\log_2 5 = 2x$$

$$x = 1.161$$

8. $8.09^{5x} = 40800$

$$\log_{8.09} 40800 = 5x$$

$$x = 1.016$$

9. $5 \cdot 3^{x+2} - 4 = -2$

$$5 \cdot 3^{x+2} = 2$$

$$3^{x+2} = \frac{2}{5}$$

$$\log_3 \left(\frac{2}{5}\right) = x+2$$

$$x = -2.834$$

Simplify. No calculator.

10. $\sqrt[3]{16} \div \sqrt[4]{32}$

$$16^{1/3} \div 32^{1/4}$$

$$\frac{2^{4/3}}{2^{5/4}} = \boxed{2^{1/12}}$$

11. $\frac{32^{1.4}}{16^{1.5}}$

$$\frac{(2^5)^{1.4}}{(2^4)^{1.5}}$$

$$\frac{2^7}{2^6} = \boxed{2}$$

12. $\sqrt[3]{\sqrt{27}}$

$$(27^{1/2})^{1/3}$$

$$(3^{3/2})^{1/3}$$

$$\boxed{3^{1/2}}$$