

Directions: Solve each equation. Check all answers for extraneous solutions.	
<p>1. $\log_4(25 - 2x) = \log_4(6x + 1)$</p> $25 - 2x = 6x + 1$ $24 = 8x$ $x = 3$	<p>2. $\log_9(8y - 9) = \log_9 108 - \log_9 4$</p> $\log_9(8y - 9) = \log_9\left(\frac{108}{4}\right)$ $8y - 9 = 27$ $8y = 36$ $y = 4.5$
<p>3. $6 \cdot \log_2 2 = \log_2 8 + \log_2(a - 2)$</p> $\log_2 2^6 = \log_2 8(a - 2)$ $64 = 8a - 16$ $80 = 8a$ $a = 10$	<p>4. $\log_6(5w + 14) = 2 \cdot \log_6 w$</p> $\log_6(5w + 14) = \log_6 w^2$ $w^2 - 5w - 14 = 0$ $(w - 7)(w + 2) = 0$ $w = 7, -2$
<p>5. $\log_7(3x + 5) = 2$</p> $7^2 = 3x + 5$ $49 = 3x + 5$ $44 = 3x$ $x = \frac{44}{3}$	<p>6. $\log_{27}(11 - 2k) = \frac{1}{3}$</p> $27^{1/3} = 11 - 2k$ $3 = 11 - 2k$ $-8 = -2k$ $k = 4$
<p>7. $\log(24x + 64) = 3$</p> $10^3 = 24x + 64$ $936 = 24x$ $x = 39$	<p>8. $5 = \log_3 8 + \log_3(r + 6)$</p> $5 = \log_3 8(r + 6)$ $3^5 = 8r + 48$ $243 = 8r + 48$ $195 = 8r$ $r = \frac{195}{8}$

9. $5^{x-4} = 25^{x-6}$

$$5^{x-4} = 5^2(x-6)$$

$$x-4 = 2x-12$$

$$\boxed{8 = x}$$

10. $36^{5v+2} = \left(\frac{1}{6}\right)^{11-v}$

$$6^2(5v+2) = 6^{-1}(11-v)$$

$$10v+4 = -11+v$$

$$9v = -15$$

$$v = \frac{-15}{9} = \boxed{-\frac{5}{3}}$$

11. $5^m = 220$

$$\log_5 220 = m$$

$$m \approx 3.3512$$

12. $14^p - 8 = 62$

$$\log_{14} 62 = p - 8$$

$$1.5639 = p - 8$$

$$p \approx 9.5639$$

13. $3 \cdot 4^{n+2} = 78$

$$4^{n+2} = 26$$

$$\log_4 26 = n + 2$$

$$2.3502 = n + 2$$

$$n \approx .3502$$

14. $5^{8-2y} - 10 = 45$

$$5^{8-2y} = 55$$

$$\log_5 55 = 8 - 2y$$

$$2.4899 = 8 - 2y$$

$$-5.5101 = -2y$$

$$y = 2.7551$$

15. $2 \cdot 10^{6c} + 9 = 17$

$$2 \cdot 10^{6c} = 8$$

$$10^{6c} = 4$$

$$\log_{10} 4 = 6c$$

$$.6021 = 6c$$

$$c \approx .1003$$

16. $9 \cdot 14^{5a+9} + 8 = 107$

$$9 \cdot 14^{5a+9} = 99$$

$$14^{5a+9} = 11$$

$$\log_{14} 11 = 5a + 9$$

$$.9086 = 5a + 9$$

$$-8.0914 = 5a$$

$$a \approx -1.6183$$