Name: Algebra 2
Date:

Solving Exponential Equations

Find all values of *x* that solve the following equations. For many problems, you may want to write both sides with the same base.

1. $2^x = 8$

2. $3 \cdot 2^x = 48$

3. $3^x = \frac{1}{9}$

4. $4^x + 7 = 71$

5. $2^x \cdot 2^{x-2} = \sqrt{2}$

6. $2^x = \frac{1}{32}$

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

8. $\sqrt[4]{3} = 9^x$

9. $2^x = \frac{4}{\sqrt{2}}$

10. $3 \cdot 2^x = 24$

11. $2 \cdot 3^{x+3} + 1 = 19$

12. $2^x = \frac{1}{\sqrt{8}}$

13. $2 \cdot 3^{2x-1} + 7 = 61$

14. $3^x = 9^7$

15. $2^x = 2\sqrt{2}$

16. $5^x = \frac{1}{\sqrt[3]{5}}$

17. $2 \cdot 2^x = 8$

18. $\left(\frac{1}{5}\right)^x = 25$

19. $2^{2x+1} \cdot 2^x = 16$

20. $6^{-x} = \frac{6}{\sqrt[5]{6}}$

21. $\left(\sqrt{2}\right)^x = 8$

22. $3^x = \left(\frac{1}{9}\right)^{4-x}$

23. $\left(2^{x+1}\right)^2 = \frac{1}{4}$

24. $4^{2x} = 8^{x-3}$

Answers

1. $x = 3$
2. $x = 4$
3. $x = -2$
4. $x = 3$
5. $x = 5/4$
6. $x = -5$
7. $x = 1$
8. $x = 1/8$
9. $x = 3/2$
10. $x = 3$
11. $x = -1$
12. $x = -3/2$
13. $x = 2$
14. $x = 14$
15. $x = 1.5$
16. $x = -1/3$
17. $x = 2$
18. $x = -2$
19. $x = 1$
20. $x = -4/5$
21. $x = 6$
22. $x = 8$