

6.2 Exponential Expressions and Equations

Name _____

Evaluate each expression for the given value.

1. 3^x for $x = -2$

2. 2^x for $x = -3$

3. 27^x for $x = \frac{1}{3}$

4. 81^x for $x = \frac{1}{2}$

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

6. $\left(\frac{1}{8}\right)^x$ for $x = \frac{1}{3}$

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

8. $\left(\frac{1}{8}\right)^x$ for $x = -\frac{1}{3}$

Answers: 1. $\frac{1}{9}$; 3. 3; 5. $\frac{1}{2}$; 7. 2

Solve for x .

9. $25 = 5^x$

10. $81 = 3^x$

11. $64 = 2^x$

12. $27 = 3^x$

13. $25^x = 5$

14. $81^x = 3$

15. $\frac{1}{25} = 5^x$

16. $\frac{1}{81} = 3^x$

Answers: 9. 2; 11. 6; 13. $\frac{1}{2}$; 15. -2

Solve for x .

17. $4^x = 32$

18. $27^x = 9$

19. $16^{x-1} = 4$

20. $27^{x+1} = 81$

21. $5^{2x} = \frac{1}{25}$

22. $3^{4x} = \frac{1}{27}$

Answers: 17. $\frac{5}{2}$; 19. $\frac{3}{2}$; 21. -1

Solve for x .

23. $\left(\frac{1}{2}\right)^x = 16$

24. $\left(\frac{1}{9}\right)^{x+1} = 27$

25. $4^{2x} = 8^{x-1}$

26. $9^{2x-4} = 3^{x+3}$

Answers: 23. -4 ; 25. -3

Use the compound interest formula to find the accumulation amount for each of the following scenarios.

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

27. Principal: \$2,000
Annual rate: 4.6%
Number of years: 3
Compound: yearly

28. Principal: \$3,500
Annual rate: 2.7%
Number of years: 4
Compound: monthly

29. Principal: \$4,600
Annual rate: 3.8%
Number of years: 1
Compound: quarterly

30. Principal: \$2,500
Annual rate: 5.3%
Number of years: 2
Compound: semi-annually

Answers: **27.** \$2,288.99; **29.** \$4,777.31