

Exponential Functions

Graph the following exponential functions.

1. $f(x) = 3^x$

2. $f(x) = 2^x$

3. $f(x) = \left(\frac{1}{3}\right)^x$

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

5. $f(x) = 10^x$

6. $f(x) = 5^x$

7. $f(x) = 3^{-x}$

8. $f(x) = 2^{-x}$

9. $f(x) = e^x$

10. $f(x) = \left(\frac{1}{e}\right)^x$

11. $f(x) = e^{-x}$

12. $f(x) = 10^{-x}$

13. **Investment**- An investor invests \$ 5000.00 an annual interest rate of 8.5% for 20 years. How much would his money grow if interest were compounded:

- a) Annually
- b) Semi-annually
- c) Quarterly
- d) Monthly
- e) Continuously

14. **Investment**- An investor invests \$ 5000.00 annual interest rate of 8.5% for 20 years. How much would his money grow if interest were compounded:

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15. **Population Growth**- ELAC's student population in 2000 was 15,000 students and has grown at an average rate of 4% per year. What is ELAC's student population in 2012?

16. **Population Growth**- ELAC's student population in 2000 was 15,000 students and has grown at an average rate of 6% per year. What is ELAC's student population in 2015?

17. **Population Decay**- Bacteria that experiences antibiotics declines at a rate of 6% per hour. If 5,000 pesky bugs are present at noon when antibiotics are initially applied, how many pesky bugs are present at 10PM that same day?

18. **Population Decay**- Bacteria that experiences antibiotics declines at a rate of 5% per hour. If 8,000 pesky bugs are present at noon when antibiotics are initially applied, how many pesky bugs are present at midnight that same day?

Use properties of exponents to solve for x.

19. $2^x = 8$

20. $3^x = 9$

21. $5^x = 125$

22. $4^x = 64$

23. $10^x = 100$

24. $10^x = 1000$

25. $2^{x+1} = 8$

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

27. $4^{-x} = 16$

28. $3^{-x} = 27$

29. $3^{x-2} = 81$

30. $3^{x+2} = 27$

31. $3^x = \frac{1}{9}$

32. $4^x = \frac{1}{4}$

33. $2^x = \frac{1}{16}$

34. $5^x = \frac{1}{625}$

35. $6^x = 6$

36. $5^x = 5$

37. $2^{x-4} = 2$

38. $3^{x-4} = 3$

39. $4^x = 8$

40. $2^x = 8$

41. $9^x = 3$

42. $27^x = 9$

43. $1000^x = 100$

44. $1000^x = 10$

45. $16^x = 1$

46. $8^x = 1$