

Algebra 1

Writing Equations of Lines

Graphing Linear Equations

Geometry/Trig

Pythagorean Theorem

Special Right Triangles (30-60-90 and 45-45-90)

Right Triangle Trigonometry $S \frac{o}{h}$ $C \frac{a}{h}$ $T \frac{o}{a}$

Important Topics from Algebra II/Trigonometry

Solving Equations, Absolute Value Equations, and Inequalities

Operations with Radicals and Imaginary numbers

Solving Radical Equations

Quadratics

- FACTORING

- Solving for roots

- Quadratic form, intercept form, vertex form

- Completing the square

Properties of Exponents including Rational Exponents

Logarithms

- Expanding and condensing

- Logarithmic to exponential form and exponential to logarithmic form

- Solving Logarithmic Equations

- Graphing logarithms and exponential functions

Parent Graphs

- Domain and Range (interval notation)

- Transformations

- inverses

Operations with Functions (include restrictions where appropriate)

Piecewise Functions

Polynomials 2nd, 3rd, 4th, and 5th degree

- End behavior

- Relative maximum and relative minimum

- Intervals of increasing and decreasing

- Rational Root Theorem

- Synthetic division

- Complex roots

Rational Expressions

- All operations (+, -, x, ÷)

- Graphing (asymptotes, holes, domain and range)

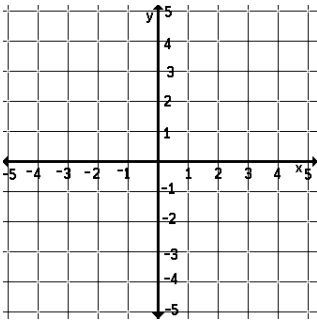
Write the equation of the line using the information given.

1. Through the points $(-1, 3)$ and $(2, -4)$.

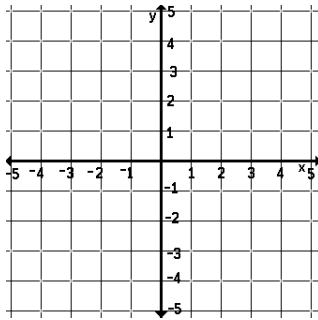
2. Perpendicular to the line $2x - 3y = 4$ and through the point $(4, -2)$.

3. Parallel to $x = -1$ and through the point $(-2, 3)$.

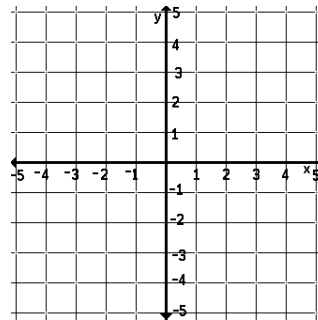
4. $y = -\frac{1}{3}x$



5. $y = 2$

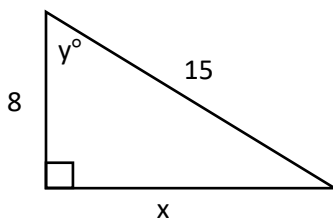


6. $-2x - 2y = 6$

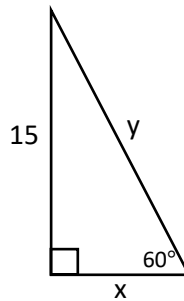


Solve for x and y .

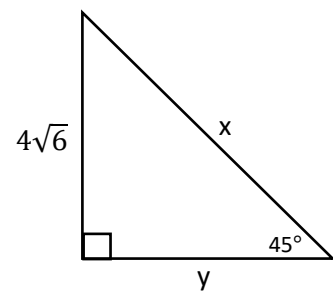
7.



8.



9.



Factor each of the following completely.

10. $x^3 - x^2 - 6x$

11. $3x^2 - 10x - 8$

12. $x^3 + 3x^2 - 4x - 12$

Solve each of the following for x.

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

14. $x^4 - 16 = 0$

15. $x^2 - 8x + 3 = 0$

16. $2x^2 - 21x + 49 = 0$

17. $\frac{x}{3} - \frac{x-2}{4} = 2$

18. $\sqrt{x} - 2 = x - 8$

Simplify each of the following.

19. $\sqrt{72}$

20. $\sqrt{40} + \sqrt{90}$

21. $\sqrt{50} - \sqrt{8}$

22. $2\sqrt{3} \cdot 3\sqrt{6}$

23. $\frac{2}{\sqrt{2}}$

24. $\frac{3}{\sqrt{6}}$

25. $\frac{\sqrt{10}}{\sqrt{5}}$

26. $\frac{\sqrt{30}}{\sqrt{45}}$

27. $\sqrt{-10} \cdot \sqrt{-15}$

28. $\sqrt{-45}$

29. $\frac{2}{3-i}$

Write each exponential equation in logarithmic form.

30. $5^x = 625$

31. $10^x = 1000$

32. $e^3 = 20.085$

33. $u^v = w$

Rewrite each logarithmic equation in exponential form.

34. $\log_2 \frac{1}{8} = -3$

35. $\ln 143 = x$

36. $\log_4 64 = 3$

37. $\log \frac{1}{100} = -2$

Evaluate without using a calculator.

38. $\log_x x^8 =$ _____

39. $\ln e^3 =$ _____

40. $\log 100 =$ _____

41. $e^{\ln 12} =$ _____

42. $\log_{27} 3 =$ _____

43. $\log_3 81 =$ _____

Expand each logarithmic expression. Your answer may not contain any exponents or radicals.

44. $\log \left(\frac{x^3 \sqrt{y+1}}{z^2} \right)$

45. $\ln \left(\frac{y\sqrt{x}}{wz} \right)$

Condense each logarithmic expression.

46. $3 \log x + 2 \log y + \frac{1}{2} \log z$

47. $3 \ln x + 2 \ln 5 - \ln(x + 2)$

Solve the exponential equations. Round any irrational answers to the nearest thousandths.

48. $3^{x-2} = 27$

49. $4(5^{x+2}) = 32$

50. $3e^x + 5 = 24$

51. $\log_4(x - 1) = 2$

52. $\ln x = 2$

53. $\log x = 6$

Application Problems.

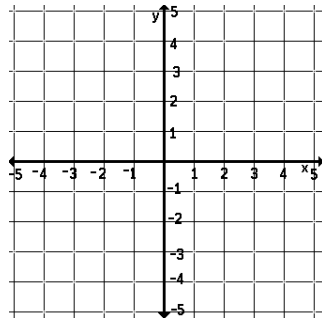
Simple Compound Interest: $A = P \left(1 + \frac{r}{n}\right)^{nt}$

Continuous Compound Interest: $A = Pe^{rt}$

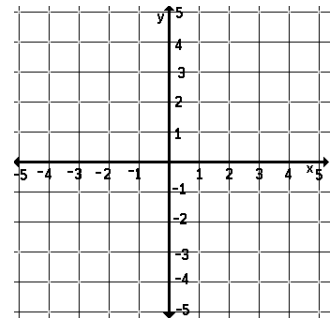
54. Emily plans to put her graduation money into an account and leave it there for 4 years while she goes to college. She receives \$1,050 in graduation money to college that she puts into an account that earns 4.25%. How much money will be in Emily's account at the end of four years if it is compounded...
- a.) Quarterly?
 - b.) Monthly?
 - c.) Continuously?
 - d.) If the interest is compounded semi-annually, how long would it take for the balance to reach \$2,000? Round to the nearest hundredth of a year.

Graph each of the following without the aid of a graphing calculator.

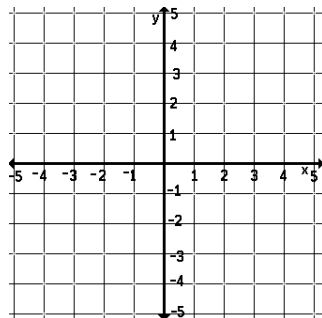
55. $y = x^2 - 3x - 4$



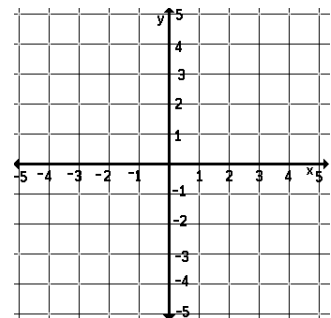
56. $y = x^3 + x^2 - x - 1$



57. $y = 2|x - 3| - 2$

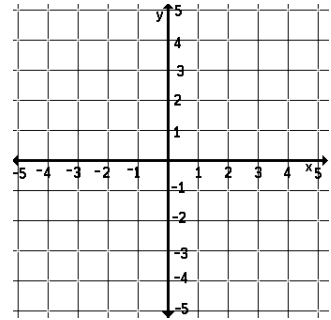


58. $y = \frac{2x-1}{x+1}$



Find the inverse of the function. Graph both the function and its inverse. Confirm that the functions are inverses algebraically.

59. $f(x) = (x - 2)^3 + 1$



Perform the requested operations given the functions.

$$f(x) = x - 3$$

$$g(x) = x^2 - 9$$

60. $f(x) + g(x)$

61. $f(x) - g(x)$

62. $\frac{f(x)}{g(x)}$

63. $\frac{g(x)}{f(x)}$

64. $f(g(x))$

65. $g(f(x))$

66. $f(g(-2))$

67. $f(x) \cdot g(x)$