

1. Evaluate.  $(64)^{2/3}$
2. Simplify.  $(6^{3/4})^{-8/15}$
3. Sketch the graph of the function and its inverse on the same coordinate plane.  $f(x) = 3 - 3x$
4. Graph.  $f(x) = \sqrt{x} - 3$
5. A certain gas will escape from a storage tank according to the formula  $g = 190\sqrt{p}$ , where  $g$  represents the amount escaping per minute in gallons, and  $p$  represents the pressure in pounds per square inch. What is the pressure on the gas when about 475 gallons per minute are escaping? (round your answer to the nearest tenth)
6. Solve the equation. Check for extraneous solutions.  $\sqrt[3]{y-3} = 4$
7. Solve.  $2e^x - 1 = 15$
8. Find the mean of the set of numbers to the nearest hundredth. {34, 31, 11, 39, 37, 26, 18, 16}
9. Find the value of \$2000.00 deposited for 10 years in an account paying 12% annual interest compounded monthly.
10. A piece of equipment costs \$70,000 new but depreciates 10% per year in each succeeding year. Find its value after 12 years.
11. Graph.  $f(x) = 1 + e^x$
12. If \$7000 is invested at a rate of 9% compounded continuously, find the balance in the account after 3 years. Use the formula  $A = Pe^{rt}$ .
13. Evaluate without using a calculator.  $\log_6\left(\frac{1}{36}\right)$
14. Use the change-of-base formula to evaluate the expression  $\log_7(25)$
15. Expand the expression.  $\log_8\left(8\sqrt{\frac{x}{y}}\right)$
16. Solve for x.  $\log_{10}(16) - \frac{1}{2}\log_{10}(x) = \log_{10}(4)$
17. Solve the equation.  $8^{-0.2x} - 2 = 6$

18. The price per person of renting a bus varies inversely with the number of people renting the bus. It costs \$31 per person if 35 people rent the bus. How much will it cost per person if 81 people rent the bus?

19. Sketch the graph of the function.  $f(x) = \frac{4-2x}{x-3}$

20. Identify the horizontal and vertical asymptotes of the graph of the function.  $f(x) = \frac{x^2}{x^2-9}$

21. Divide and simplify.  $\frac{x^2+9x+20}{5x^3+10x^2} \div \frac{5x^2+25x}{x^2+6x+8}$

22. Perform the operations and simplify.  $\frac{3x-5}{x^2-36} - \frac{2}{x-6}$

23. Solve the equation.  $\frac{x}{15} - \frac{10}{2x} = \frac{1}{3}$

24. Find the distance between the points (-5,6) and (3,0).

25. Identify the focus and the directrix of the parabola given by  $y^2 + 5x = 0$

26. Write the standard form of the equation of the circle that passes through the point (6,8) with its center at the origin.

27. Graph.  $4x^2 + 9y^2 = 36$

28. Find the asymptotes and sketch the hyperbola.  $\frac{y^2}{25} - \frac{x^2}{64} = 1$

29. Write the equation in standard form and classify the conic section.  $x^2 + y^2 - 2x - 8y + 15 = 0$

30. Classify the conic section as a circle, an ellipse, a hyperbola, or a parabola.

$$5x^2 - 7y^2 - 3x + 7y - 14 = 0$$

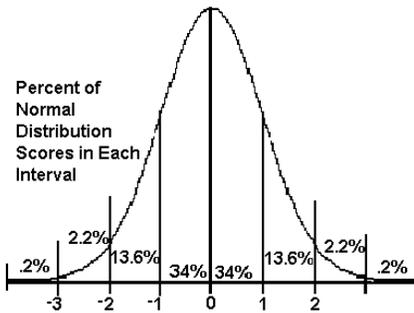
31. Find the points of intersection, if any, of the graphs in the system.  $\begin{cases} y^2+4x=0 \\ x+y=0 \end{cases}$

32. For the given configuration, determine how many different passwords are possible if: (a) digits and letters can be repeated, (b) digits and letters CANNOT be repeated. 3 digits followed by 5 letters.

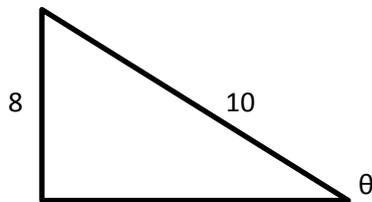
33. Evaluate each of the following: a) 6!      b)  ${}_8C_3$       c)  ${}_6P_2$

34. Find the number of all possible 3-card hands that contain: a) 3 face cards      b) 3 clubs.

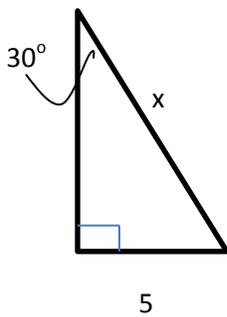
35. Expand the following binomial:  $(x - 2y)^4$
36. A card is randomly selected from a standard deck of 52 cards. What is the probability that the card is a 3 or a diamond?
37. A normal distribution has a mean of 44 and a standard deviation of 7. Find the probability that a randomly selected x-value is in the given interval: a) between 37 and 58 b) at least 65



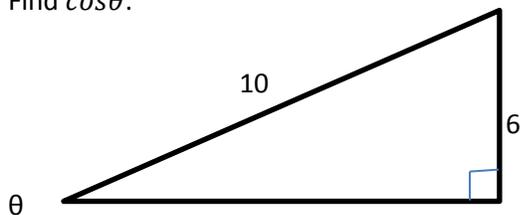
38. Given the diagram, find the six trigonometric functions.



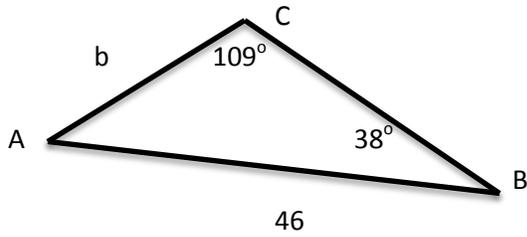
39. What is the value of x?



40. Find  $\cos\theta$ .



41. What is the approximate value of  $b$  in the triangle shown?



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