

1. Write the exponential equation in its equivalent logarithmic form. $3^2 = 9$
2. Use a calculator to approximate the logarithm to four decimal places in 164
3. Evaluate. $\log 0.01$
4. Write the expression as the sum or difference of logarithms.

$$\log_b \frac{m^2}{(m-n)^4}$$
5. Evaluate $\log_8 \frac{1}{64}$
6. Solve:
 The annual depreciation rate r ($0 < r < 1$) of a car purchased for P dollars and worth A dollars after t years can be modeled by the following formula:

$$\log(1-r) = \frac{1}{t} \log \frac{A}{P}$$

Find the depreciation rate of a car that is purchased for \$36,000.00 and sold 3 years later for \$16,000.00. Express

6. continue your answer as a percentage, and round the answer to the nearest whole percentage

7. Graph the function $y = 2^{3x} - 4$

8. Solve $\log_{\frac{1}{2}} 16 = x$

9. Given $f(x) = \frac{10}{x^2}$; $g(x) = 4 - x$,

Find $(f \circ g)(x)$

10. Given $f(x)$ and $g(x)$, perform the indicated operation

$$f(x) = 3x - 7; \quad g(x) = 8x^2 - x - 9$$

Find $(f \cdot g)'(x)$.

11. multiply and simplify

$$\frac{y^2 - 64}{6y + 12} \cdot \frac{y + 2}{y - 8} =$$

Simplify your answer. Use integers or fractions for any numbers in the expression

12. Subtract. Simplify by removing a factor of 1 when possible.

$$\frac{2 - 9}{7z + 42} - \frac{2 + 4}{9z + 5} \quad \text{the difference is } \square$$

13. Simplify

$$\frac{\frac{9a^2 - b^2}{ab}}{\frac{3a - b}{b}}$$

14. Solve

The solution is $y = \square$

$$\frac{70}{y} - \frac{70}{y-3} = \frac{2}{y}$$

(Simplify) (Type an integer or a fraction.
Type N if there is no solution)

15. Cambridge ate 32 sausages in the first 13 minutes of a high-stakes eating contest. Assuming that he continued at the same pace, how many sausages would he have eaten by the end of the 15-minute contest?
(Round to the nearest whole number)

16. Multiply $\sqrt[3]{7} \cdot \sqrt[3]{49} =$

17. Add. Simplify by collecting like radical term if possible $7\sqrt{50} + 2\sqrt{32}$

(Simplify your answer. Type an exact answer, using radicals as needed)

18. Multiply $(4 - \sqrt{7})(3 + \sqrt{7})$
(Type an exact answer, using radicals as needed)

19. Rationalize the denominator
 $\sqrt[3]{\frac{250}{9}} =$

20. Add and Simplify
 $(7 - i) + (-3 + 8i) =$

21. Solve for x
 $x^2 + 17 = 2x$
(Simplify your answers. Type your answer in the form $a + bi$. Use a comma to separate answers. Type N if there is no solution)

22. The outside of a picture frame measures 14 in by 20 in. 100 in^2 of the picture shows. Find the thickness of the frame.

The thickness of the frame is approx $\boxed{}$ in.
(Round to the nearest hundredth)

23. Find and label the vertex and the line of the symmetry. Graph the function $f(x) = 3(x-1)^2$

The vertex is (type an ordered pair)
The equation of the line of symmetry is $x =$

24. Find the vertex, the line symmetry, the maximum, or minimum value of the quadratic function, and graph the function $f(x) = -2x^2 + 2x + 6$

The x-coordinate of the vertex is
(Type a simplified fraction)

The y-coordinate of the vertex is
(Type a simplified fraction)

The equation of the line of symmetry is $x =$
(Type a simplified fraction)

The maximum/minimum of $f(x)$ is
(Type a simplified fraction)

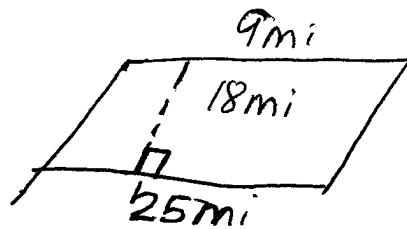
The value, $f\left(\frac{1}{2}\right) = \frac{13}{2}$ is ?

minimum

maximum

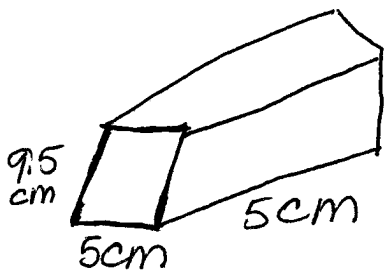
25. Solve $x^2 - 6x - 16 < 0$
The solution set is $\{x \mid \square\}$.
(Use at least one inequality or compound inequality to express

26. Find the area.



(Simplify your answer. Type an integer or a decimal)

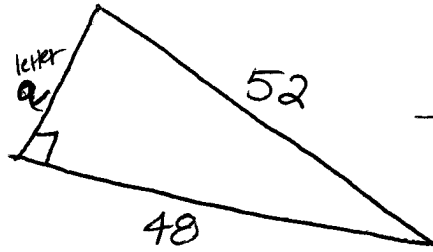
- 27.



Find the volume of the figure on the left.

(Simplify your answer. Type an integer or a decimal)

28.



Find the length of the third side of the right triangle. Give an exact answer and an approximation to three decimal places if needed

The length of the third side is
 (Simplify your answer. Type an integer or a decimal)

29. Find the measure of the complement of a 35° angle.
 (Simplify your answer. Type an integer or a decimal)

30. Convert to Celsius. Approximate to the nearest ten degrees. Use the scales in the text. 150°F

The solution is $^\circ\text{C}$

(Simplify your answer. Type an integer or a decimal. Round to the nearest tenth if needed)

31. Graph the ellipse

$$\frac{x^2}{1} + \frac{y^2}{9} = 1$$

32. Graph the hyperbola on paper and then choose the correct graph
 $x^2 = 25 + y^2$

33. Complete $132 \text{ in} = ? \text{ ft}$
(Simplify your answer. Type an integer or a fraction)

34. Graph the function on paper, and then choose the correct graph
 $f(x) = 6^x$

35. Determine whether the function is one-to-one. If it is, find a formula for its inverse $g(x) = \frac{-5}{x}$

Is the function one-to-one YES OR NO
 $g^{-1}(x) = \square$

36. Express as a sum logarithms
 $\log_4(16 \cdot 18)$

37. Convert to an exponential equation
 $4 = \log_3^3 \quad \square = 3$

(Simplify your answer. Type in exponential form)

38. Use a calculator to find the natural logarithm base e

$$\ln 0.0589 = \boxed{}$$

(Simplify your answer. Type an integer or a decimal. Round to 4 decimal places if needed.)

39. Solve for x $5^{2x-7} = 25$

The solution is $x = \boxed{}$

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers. Type N if the solution is not a real number.)

40. Graph the inverse of the function $f(x) = (x+3)^3$