

ALGEBRA PROBLEM SESSION #14 - PRACTICE PROBLEMS

Logarithmic Functions

- Describe the appearance of the graph of $y = f(x) = \log_b x$ when $0 < b < 1$ and when $b > 1$.
- Graph $y = f(x) = -\log_3 x$. How does the graph compare to the graph of $y = f(x) = \log_3 x$?
- Find a logarithmic function that passes through the points (1, 0) and (5, 1).
- Find each value: (a) $\log_3 9$ (b) $\log_5 0.04$
- Find x : (a) $\log_2 x = 5$ (b) $\log_x 32 = 5$ (c) $\log_x 1 = 0$
- Graph $y = f(x) = \log(x - 2)$
- Graph $y = x^4$ and $y = \log_4 x$
- Write in exponential form: (a) $2 = \log_9 x$ (b) $\log_5 125 = y$
- Write each equation in logarithmic form: (a) $5^{-3} = \frac{1}{125}$ (b) $15^2 = x$
- Evaluate: (a) $\log_3 27$ (b) $\log_3 \frac{1}{\sqrt{3}}$ (c) $\log_{11} 11$ (d) $\log_4 4^6$
- Graph $f(x) = \left(\frac{1}{2}\right)^x$ and $g(x) = \log_{\frac{1}{2}} x$ in the same rectangular coordinate system.
- Find the domain: (a) $f(x) = \log_5(x + 6)$ (b) $f(x) = \log(7 - x)$
- What question can be asked to help evaluate $\log_3 81$?
- Explain how to use the graph of $f(x) = 2^x$ to obtain the graph of $g(x) = \log_2 x$.

Distance and Midpoint Formulas

- Find the perimeter and area of a figure that has vertices at (0, 5), (0, -5) and (-5, 0).
- Find the distance between each pair of points: a. $(-4, -1)$ and $(2, -3)$ b. $(0, -\sqrt{2})$ and $(\sqrt{7}, 0)$
- Find the midpoint of the line segment with the given endpoints:
a. $(10, 4)$ and $(2, 6)$ b. $(\sqrt{50}, -6)$ and $(\sqrt{2}, 6)$
- Write the standard form of the equation of the circle with the given center and radius: Center (0,0), $r = 8$
- Give the center and radius of the circle described by the equation and graph.
a. $x^2 + y^2 = 49$ b. $(x - 2)^2 + (y - 3)^2 = 16$
- Complete the square and write in standard form. Give the center and radius of the circle and graph.
 $x^2 + y^2 + 8x + 4y + 16 = 0$
- How is the standard form of a circle's equation obtained from its general form?
- Does $(x - 3)^2 + (y - 5)^2 = -25$ represent the equation of a circle? What sort of set is the graph of this equation?
- A triangle has vertices (corners) at (13,6), (13,1), and (1,1). Is it a right triangle?