

## 4.5.1: Graphs and Properties of Logarithmic Functions (Exercises)

### SECTION 4.5 PROBLEM SET: GRAPHS AND PROPERTIES OF LOGARITHMIC FUNCTIONS

Questions 1 – 3: For each of the following functions

- Sketch a reasonably accurate graph showing the shape of the graph of the function
- State the domain
- State the range
- State whether the graph has a vertical asymptote or a horizontal asymptote and write the equation of that asymptote
- Does the graph have an x-intercept or a y-intercept asymptote? Write the coordinates of the x-intercept or the y-intercept.

1. $y = \ln x$ a. Sketch the graph below	b. domain: _____ c. range: _____ d. Is the asymptote horizontal or vertical? _____ Equation of the asymptote: _____ e. Coordinates of x-intercept or y-intercept: _____
2. $y = \log x$ a. Sketch the graph below	b. domain: _____ c. range: _____ d. Is the asymptote horizontal or vertical? _____ Equation of the asymptote: _____ e. Coordinates of x-intercept or y-intercept: _____
3. $y = \log_{0.8} x$ a. Sketch the graph below	b. domain: _____ c. range: _____ d. Is the asymptote horizontal or vertical? _____ Equation of the asymptote: _____ e. Coordinates of x-intercept or y-intercept: _____

Questions 4 - 5: For the pair of inverse functions  $y = e^x$  and  $y = \ln x$

- Sketch a reasonably accurate graph showing the shape of the graph of the function
- State the domain
- State the range
- State whether the graph has a vertical asymptote or a horizontal asymptote and write the equation of that asymptote
- Does the graph have an x-intercept or a y-intercept asymptote? Write the coordinates of the x-intercept or the y-intercept.

4. $y = e^x$ a. Sketch the graph below	b. domain: _____ c. range: _____ d. Is the asymptote horizontal or vertical? _____ Equation of the asymptote: _____ e. Coordinates of x-intercept or y-intercept: _____
5. $y = \ln x$ a. Sketch the graph below	b. domain: _____ c. range: _____ d. Is the asymptote horizontal or vertical? _____ Equation of the asymptote: _____ e. Coordinates of x-intercept or y-intercept: _____

Questions 6-11: Match the graph with the function.

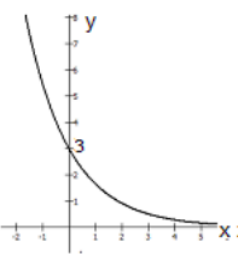
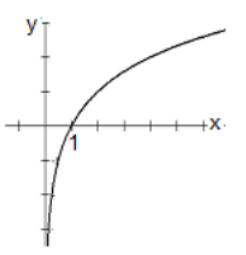
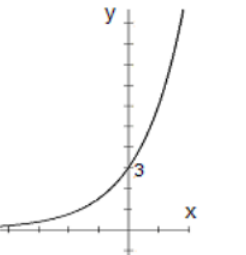
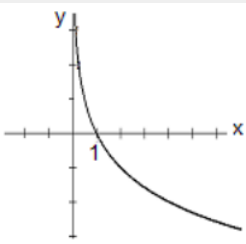
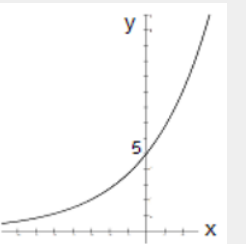
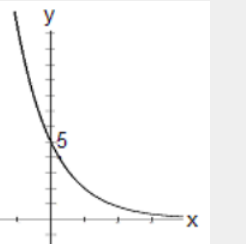
Choose the function from the list below and write it on the line underneath the graph.

Hint: To match the function and the graph, identify these properties of the graph and function

- Is the function increasing decreasing?
- Examine the asymptote

- Determine the x or y intercept

$$y = 3(2^x) \quad y = 5(0.4^x) \quad y = \log_2(x) \quad y = \log_{1/2}(x) \quad y = 3e^{-0.6x} \quad y = 5e^{0.3x}$$

<p>6. Function: _____</p> 	<p>7. Function: _____</p> 	<p>8. Function: _____</p> 
<p>9. Function: _____</p> 	<p>10. Function: _____</p> 	<p>11. Function: _____</p> 

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