Sec 7.7 Transforming Exponential and Logarithmic Functions

Graph each function, find the asymptote, state the domain and range, and describe the transformation on the parent function \( y = 2^x \)

1. \( h(x) = (2^{x-1}) + 2 \)
2. \( g(x) = -2^x - 3 \)
3. \( g(x) = 2^{x+1} + 4 \)

Asymptote: _____________  Asymptote: ______________  Asymptote: ______________
D: _____  R: _______  D: _____  R: _______  D: _____  R: _______
Transformation:  Transformation:  Transformation:

Graph each function, find the asymptote, state the domain and range, and describe the transformation on the parent function \( y = \log_2 x \)  (Remember \( \log_2 x = \frac{\log x}{\log 2} \))

4. \( f(x) = \log_2 (x - 4) + 1 \)
5. \( g(x) = -\log_2 x - 3 \)
6. \( f(x) = \log_2 (x + 1) + 2 \)

Asymptote: _____________  Asymptote: ______________  Asymptote: ______________
D: _____  R: _______  D: _____  R: _______  D: _____  R: _______
Transformation:  Transformation:  Transformation:
Write the equation for each of the following.

13. Start with the graph of \( f(x) = 2^x \). Reflect it across the x-axis and shift it 2 units to the right.

14. Start with the graph of \( f(x) = \log_2 x \). Shift it 5 units to the right and 1 unit up.

15. Start with the graph of \( f(x) = 2^x \). Shift it 5 units down.

16. Start with the graph of \( f(x) = \log_2 x \). Reflect it across the x-axis. Shift it to the left 4 units and up 2 units.

17. Start with the graph of \( f(x) = \log_2 x \). Shift it one unit to the left and 3 units down.

Find the asymptote, domain, and range for each of the following

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![Graph 1](image1.png)

D: ___________________ R: ___________________  
Asymptote: ____________________

20.  

![Graph 2](image2.png)

D: ___________________ R: ___________________  
Asymptote: ____________________

21.

![Graph 3](image3.png)

D: ___________________ R: ___________________  
Asymptote: ____________________

22.  

![Graph 4](image4.png)

D: ___________________ R: ___________________  
Asymptote: ____________________