Shift 2 Left

Shift up 1

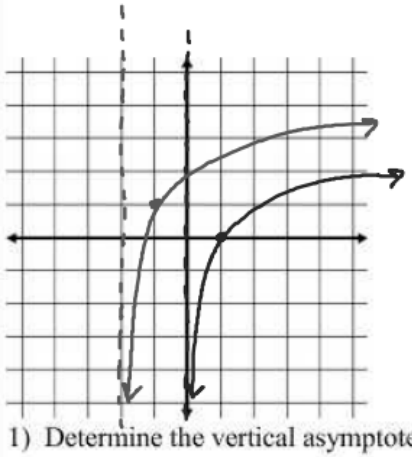
Describe how to transform the graph of y = ln x into the graph of the given function. Sketch the graph by hand.

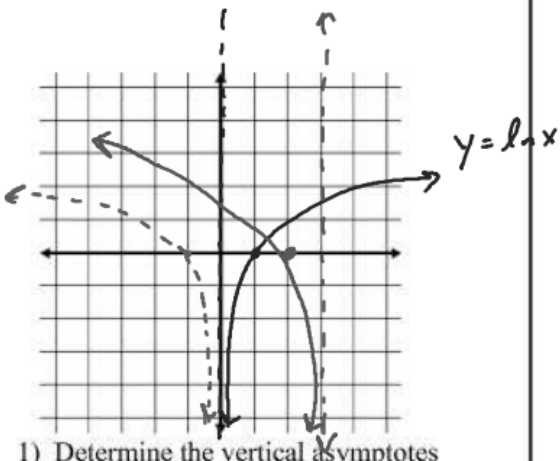
a) $g(x) = \ln(\underline{x+2}) + 1$

b) $h(x) = \ln(3 - x)$

$\ln(-x+3)$

$\ln -(x-3)$





1) Determine the vertical asymptotes

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$x = 3$

2) Determine the x-intercept

$x = -1.63$

2) Determine the x-intercept

$x = 2$

3) Determine the domain and range

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D: $(-\infty, 3)$

R: $(-\infty, \infty)$

4) Intervals of Increase or Decrease

4) Intervals of Increase or Decrease

Dec $(-\infty, 3)$

$\lim_{x \to -2^+}$

5) Determine the end behavior

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$\lim_{x \to -\infty} f(x) = \infty$ $\lim_{x \to 3^-} f(x) = -\infty$

6) Intervals of Concavity

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Concave Down

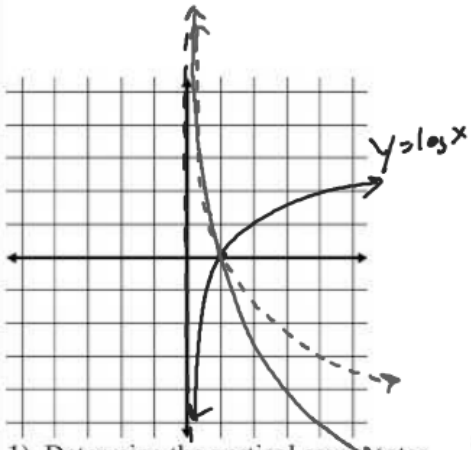
$(-\infty, 3)$

Reflection over x-axis

Vertical Stretch by factor of 3

Describe how to transform the graph of $y = \log x$ into the graph of the given function. Sketch the graph by hand.

a) $g(x) = -3\log x$



1) Determine the vertical asymptotes

$x = 0$

2) Determine the x-intercept

$x = 1$

3) Determine the domain and range

D: $(0, \infty)$

R: $(-\infty, \infty)$

4) Intervals of Increase or Decrease

Dec $(0, \infty)$

5) Determine the end behavior

$\lim_{x \to \infty} f(x) = -\infty$ $\lim_{x \to 0^+} f(x) = \infty$

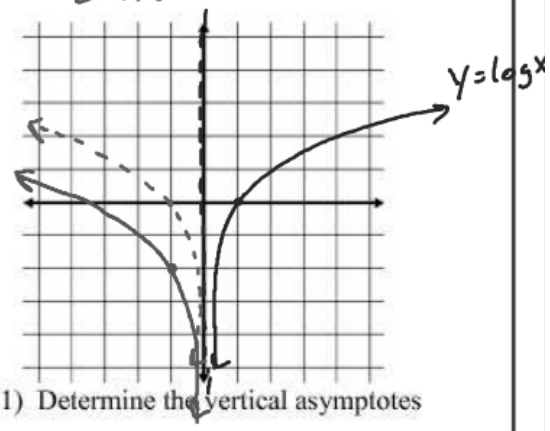
6) Intervals of Concavity

Concave up $(0, \infty)$

b) $h(x) = \log(-x) - 2$

Reflect over y-axis

Shift Down 2



1) Determine the vertical asymptotes

$x = 0$

2) Determine the x-intercept

$(-100, 0)$

3) Determine the domain and range

D: $(-\infty, 0)$

R $(-\infty, \infty)$

4) Intervals of Increase or Decrease

Dec $(-\infty, 0)$

5) Determine the end behavior

$\lim_{x \to -\infty} f(x) = \infty$ $\lim_{x \to 0^-} f(x) = -\infty$

6) Intervals of Concavity

Concave $(-\infty, 0)$

VL Due Friday 11 pm

4.3 4.4	$g(x) = \ln(x+2)+1$ $0 = \ln(x+2)+1$ $-1 = \ln(x+2)$ $e^{-1} = x+2$ $x = e^{-1}-2$ $h(x) = \log(-x)-2$ $0 = \log(-x)-2$ $2 = \log(-x)$ $-x = 10^2$ $-x = 100$ $x = -100$

What you'll Learn About

Use your Calculator to Determine which of the following are True.

1. $\log(5+2) = \log 5 + \log 2$
2. $\log(5\cdot 2) = \log 5 + \log 2$
3. $\log(5-2) = \log 5 - \log 2$
4. $\log\left(\frac{5}{2}\right) = \log 5 - \log 2$
5. $\log(5\cdot 2) = 2\log 5$
6. $\log\left(\frac{5}{2}\right) = \frac{\log 5}{\log 2}$
7. $\log(5^2) = \log 5\cdot \log 5$
8. $\log(5^2) = 2\log 5$
9. $\ln(x+2) = \ln x + \ln 2$
10. $\log(7x) = 7\log x$
11. $\log(5x) = \log\ 5 + \log x$
12. $\ln\left(\frac{x}{5}\right) = \ln x - \ln 5$
13. $\log\left(\frac{x}{4}\right) = \frac{\log x}{\log 4}$
14. $\log_4 x^3 = 3\log_4 x$
15. $\ln(x^2) = \ln x\cdot \ln x$
16. $\log|4x| = \log 4 + \log|x|$