

SCORE: _____ / 39 POINTS

NON-GRAPHING CALCULATORS ONLY

Let $f(x) = \log_2 \frac{x+1}{3}$.

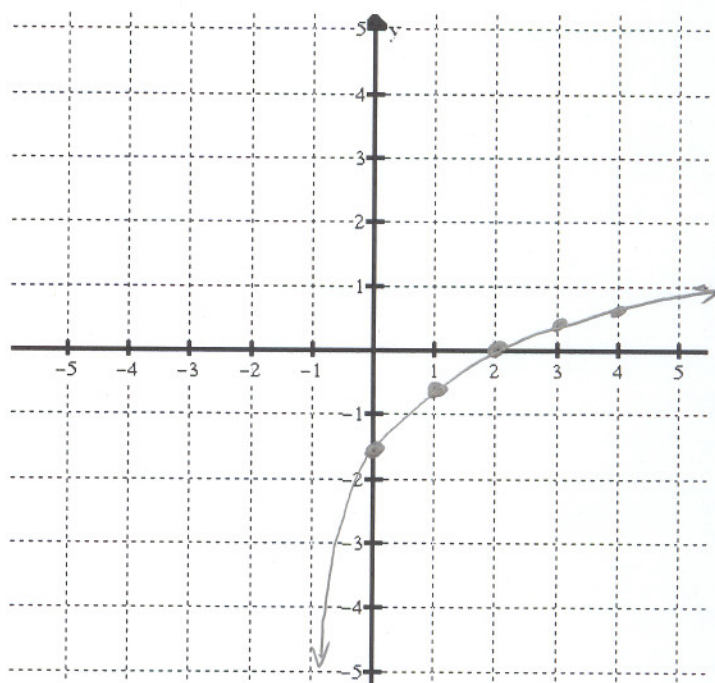
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[a] What is the equation of the vertical asymptote of the graph of $f(x)$? $\frac{x+1}{3} = 0 \Rightarrow x = -1$

[b] Fill in the following table of values. Choose your values of x based on your answer to [a]. Round your answers to 1 decimal place.

x	$f(x)$
0	-1.6
1	-0.6
2	0
3	0.4
4	0.7

[c] Plot the points from [b] on the grid below, and draw the graph of $f(x)$.



PUT A BOX AROUND EACH FINAL ANSWER

Find the intensity of an earthquake with Richter magnitude 5.9. SHOW PROPER WORK.
Round your answer to the nearest whole number.

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$$M = \log I$$

$$5.9 = \log I$$

$$I = 10^{5.9} \approx 794,328$$

Find the exact solution of $7^{x-2} = 2^{x+1}$. **SHOW PROPER WORK.**
Also, use your calculator to find a decimal answer, rounded to 4 decimal places.

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$$\ln 7^{x-2} = \ln 2^{x+1}$$

$$(x-2) \ln 7 = (x+1) \ln 2$$

$$x \ln 7 - 2 \ln 7 = x \ln 2 + \ln 2$$

$$x \ln 7 - x \ln 2 = \ln 2 + 2 \ln 7$$

$$x(\ln 7 - \ln 2) = \ln 2 + 2 \ln 7$$

$$x = \frac{\ln 2 + 2 \ln 7}{\ln 7 - \ln 2} \approx 3.6599$$

If you deposit \$2700 into an account that pays 3.91% interest annually,
after how many years will the value of the account be \$3800? **Round your answer to 2 decimal places. SHOW PROPER WORK.**

SCORE: ____ / 10 POINTS

$$3800 = 2700(1.0391)^t$$

$$\frac{38}{27} = 1.0391^t$$

$$\ln \frac{38}{27} = t \ln 1.0391$$

$$t = \frac{\ln \frac{38}{27}}{\ln 1.0391} \approx 8.91$$