

SCORE: _____ / 39 POINTS

NON-GRAPHING CALCULATORS ONLY

Let $f(x) = \log_2 \frac{x+2}{3}$.

SCORE: ____ / 12 POINTS

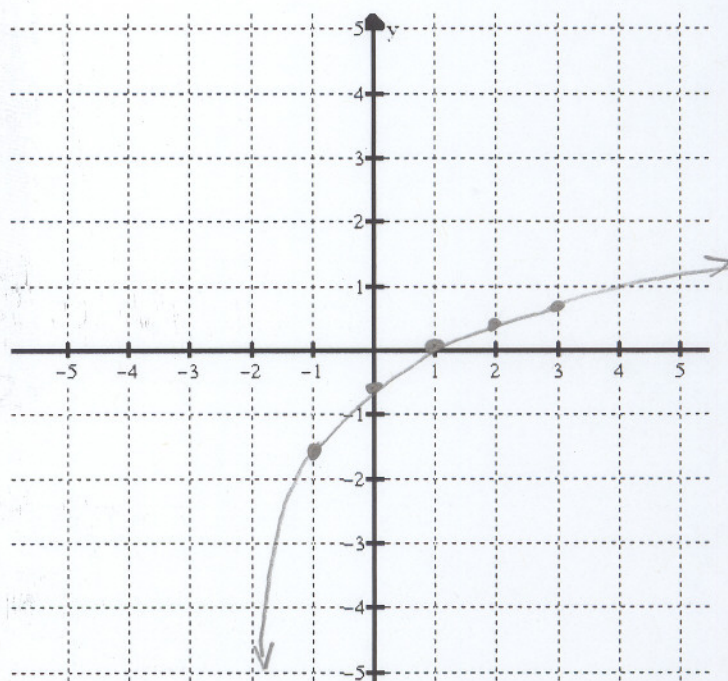
[a] What is the equation of the vertical asymptote of the graph of $f(x)$? $x = -2$

DOMAIN: $\frac{x+2}{3} > 0 \Rightarrow x > -2$

[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	$f(x)$
-1	$\log_2 \frac{1}{3} = \frac{\ln \frac{1}{3}}{\ln 2} \approx -1.6$
0	$\log_2 \frac{2}{3} \approx -0.6$
1	$\log_2 1 = 0$
2	$\log_2 \frac{4}{3} \approx 0.4$
3	$\log_2 \frac{5}{3} \approx 0.7$

[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 4.8. SHOW PROPER WORK.
Round your answer to the nearest whole number.

SCORE: ____ / 5 POINTS

$$4.8 = \log I$$

$$I = 10^{4.8}$$

$$I = \boxed{63,096 \text{ MICRONS}}$$

Find the exact solution of $9^{x-3} = 2^{x+2}$. **SHOW PROPER WORK.**
Also, use your calculator to find a decimal answer, rounded to 4 decimal places.

SCORE: ___ / 12 POINTS

$$\ln 9^{x-3} = \ln 2^{x+2}$$

$$(x-3)\ln 9 = (x+2)\ln 2$$

$$x\ln 9 - 3\ln 9 = x\ln 2 + 2\ln 2$$

$$x\ln 9 - x\ln 2 = 2\ln 2 + 3\ln 9$$

$$x(\ln 9 - \ln 2) = 2\ln 2 + 3\ln 9$$

$$x = \frac{2\ln 2 + 3\ln 9}{\ln 9 - \ln 2} \approx 5.3042$$

If you deposit \$1900 into an account that pays 3.58% interest annually,
after how many years will the value of the account be \$2600? **Round your answer to 2 decimal places. SHOW PROPER WORK.**

SCORE: ___ / 10 POINTS

$$2600 = 1900(1 + 0.0358)^t$$

$$2600 = 1900(1.0358)^t$$

$$\frac{26}{19} = 1.0358^t$$

$$\ln \frac{26}{19} = t \ln 1.0358$$

$$t = \frac{\ln \frac{26}{19}}{\ln 1.0358} \approx \boxed{8.92 \text{ YEARS}}$$