

SCORE: _____ / 35 POINTS

NON-GRAPHING CALCULATORS ONLY

Let $f(x) = 4 \log_6(3x + 6)$.

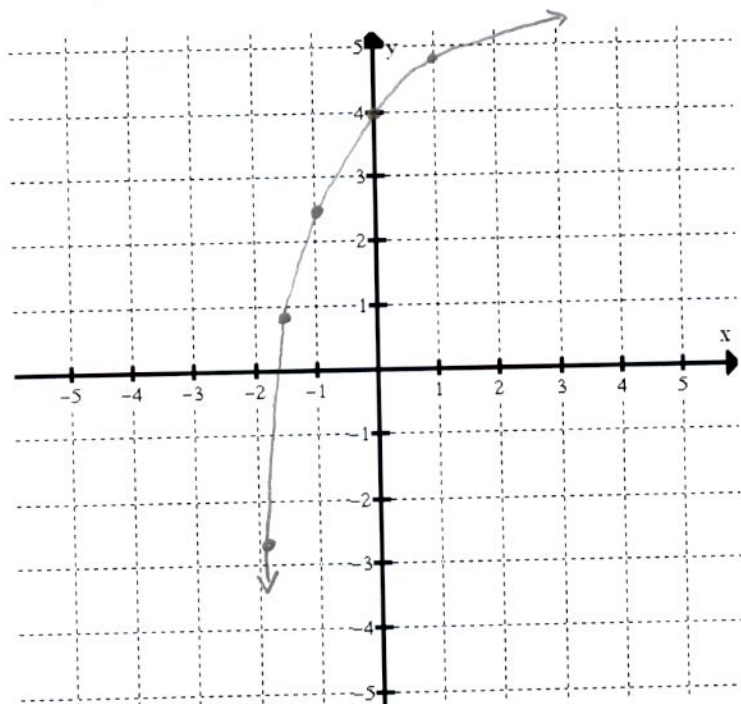
SCORE: ____ / 12 POINTS

[a] What is the equation of the vertical asymptote of the graph of $f(x)$? $x = -2$
 $3x + 6 = 0$
 $x = -2$

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

Value of x →	-1.9	-1.5	-1	0	1
Value of $f(x)$ →	-2.7	0.9	2.5	4	4.9

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

SCORE: ____ / 4 POINTS

$$5.7 = \log I$$

$$10^{5.7} = I$$

$$I \approx 501,187$$

If you deposit \$6200 into an account that pays 3.98% interest annually,
after how many years will the value of the account be \$11100?

SCORE: ___ / 9 POINTS

Round your answer to 2 decimal places. SHOW PROPER WORK.

$$11,100 = 6,200(1 + 0.0398)^t$$

$$\frac{111}{62} = 1.0398^t$$

$$\log \frac{111}{62} = \log 1.0398^t$$

$$\log \frac{111}{62} = t \log 1.0398$$

$$t = \frac{\log \frac{111}{62}}{\log 1.0398} \approx 14.92 \text{ YEARS}$$

Find the exact solution of $4^{3x-2} = 6^{2x-1}$. SHOW PROPER WORK. NO CREDIT FOR GUESS & CHECK. SCORE: ___ / 10 POINTS
Also, use your calculator to find the decimal approximation of your exact solution, rounded to 4 decimal places.

$$\log 4^{3x-2} = \log 6^{2x-1}$$

$$(3x-2)\log 4 = (2x-1)\log 6$$

$$3x\log 4 - 2\log 4 = 2x\log 6 - \log 6$$

$$3x\log 4 - 2x\log 6 = 2\log 4 - \log 6$$

$$x(3\log 4 - 2\log 6) = 2\log 4 - \log 6$$

$$x = \frac{2\log 4 - \log 6}{3\log 4 - 2\log 6} \approx 1.7047$$