

SCORE: _____ / 35 POINTS

NON-GRAPHING CALCULATORS ONLY

Let $f(x) = 3\log_5(2x + 8)$.

SCORE: ____ / 12 POINTS

[a] What is the equation of the vertical asymptote of the graph of $f(x)$? $x = -4$

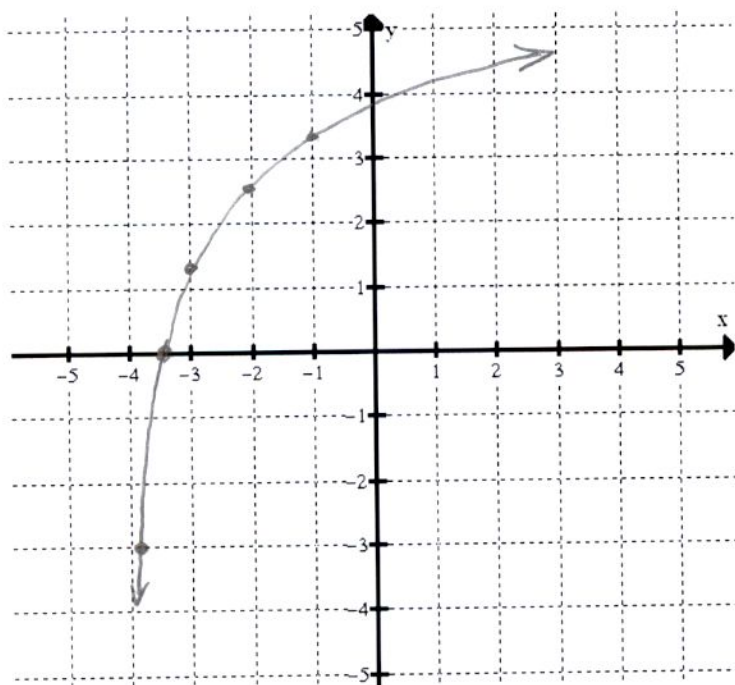
$$2x + 8 = 0$$

$$x = -4$$

[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 →	-3.9	-3.5	-3	-2	-1
Value of $f(x)$ →	-3	0	1.3	2.6	3.3

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

SCORE: ____ / 4 POINTS

$$5.2 = \log I$$

$$10^{5.2} = I$$

$$I \approx 158,489$$

If you deposit \$8200 into an account that pays 3.76% interest annually, after how many years will the value of the account be \$11700? **SCORE: ___ / 9 POINTS**
Round your answer to 2 decimal places. SHOW PROPER WORK.

$$11,700 = 8,200(1 + 0.0376)^t$$

$$\frac{117}{82} = 1.0376^t$$

$$\log \frac{117}{82} = \log 1.0376^t$$

$$\log \frac{117}{82} = t \log 1.0376$$

$$t = \frac{\log \frac{117}{82}}{\log 1.0376} \approx 9.63 \text{ YEARS}$$

Find the exact solution of $9^{3x-2} = 6^{5x-4}$. **SCORE: ___ / 10 POINTS**
SHOW PROPER WORK. NO CREDIT FOR GUESS & CHECK.
Also, use your calculator to find the decimal approximation of your exact solution, rounded to 4 decimal places.

$$\log 9^{3x-2} = \log 6^{5x-4}$$

$$(3x-2) \log 9 = (5x-4) \log 6$$

$$3x \log 9 - 2 \log 9 = 5x \log 6 - 4 \log 6$$

$$3x \log 9 - 5x \log 6 = 2 \log 9 - 4 \log 6$$

$$x(3 \log 9 - 5 \log 6) = 2 \log 9 - 4 \log 6$$

$$x = \frac{2 \log 9 - 4 \log 6}{3 \log 9 - 5 \log 6} \approx 1.1713$$