

SCORE: _____ / 35 POINTS

NON-GRAPHING CALCULATORS ONLY

Let $f(x) = 2\log_3(4x + 20)$.

SCORE: ____ / 12 POINTS

[a] What is the equation of the vertical asymptote of the graph of $f(x)$? $x = -5$

$$4x + 20 = 0$$

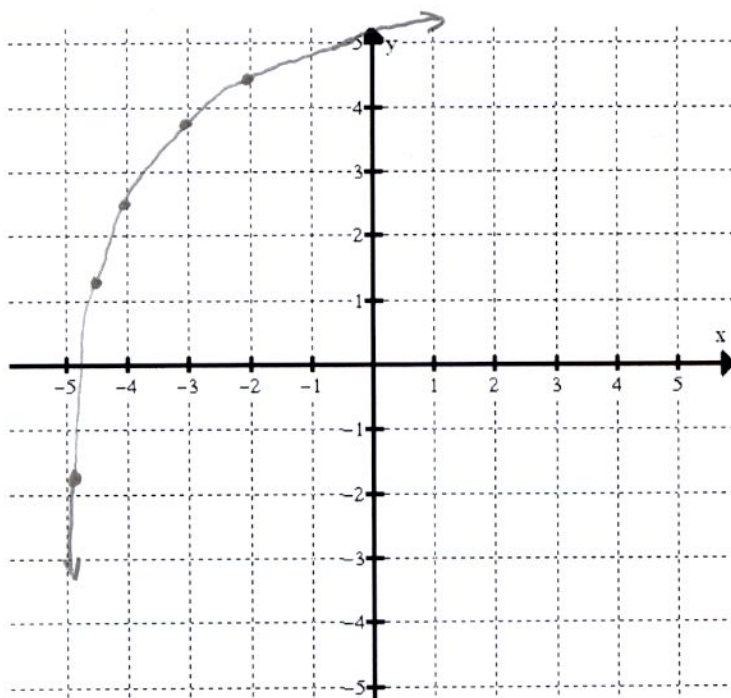
$$x = -5$$

[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 →	-4.9	-4.5	-4	-3	-2
Value of $f(x)$ →	-1.7	-1.3	2.5	3.8	4.5

[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.

SCORE: ____ / 4 POINTS

$$5.9 = \log I$$

$$10^{5.9} = I$$

$$I \approx 794,328$$

If you deposit \$7100 into an account that pays 3.87% interest annually,
after how many years will the value of the account be \$10600 ?

SCORE: ___ / 9 POINTS

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

$$10,600 = 7,100 (1 + 0.0387)^t$$

$$\frac{106}{71} = 1.0387^t$$

$$\log \frac{106}{71} = \log 1.0387^t$$

$$\log \frac{106}{71} = t \log 1.0387$$

$$t = \frac{\log \frac{106}{71}}{\log 1.0387} \approx 10.55 \text{ YEARS}$$

Find the exact solution of $8^{2x-1} = 5^{4x-3}$. 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.

$$\log 8^{2x-1} = \log 5^{4x-3}$$

$$(2x-1) \log 8 = (4x-3) \log 5$$

$$2x \log 8 - \log 8 = 4x \log 5 - 3 \log 5$$

$$2x \log 8 - 4x \log 5 = \log 8 - 3 \log 5$$

$$x(2 \log 8 - 4 \log 5) = \log 8 - 3 \log 5$$

$$x = \frac{\log 8 - 3 \log 5}{2 \log 8 - 4 \log 5} \approx 1.2062$$