

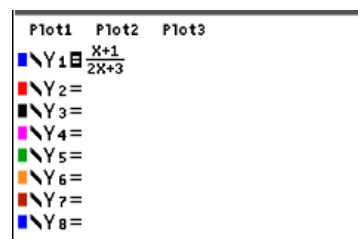
Chapter 4 / **Example 7****Finding horizontal asymptotes**

Find the horizontal asymptote of $f(x) = \frac{x+1}{2x+3}$.

Press $[f1]$ $[y=]$ to display the equation entry screen.

Press $[\text{ALPHA}]$ $[f1]$ 1:n/d to select the fraction template.

Type $\frac{x+1}{2x+3}$ and press $[\text{enter}]$ to enter the equation as Y_1 .

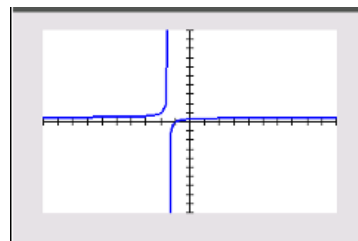


Press $[f5]$ $[\text{graph}]$ to display the graph screen.

The GDC now displays the quadratic function:

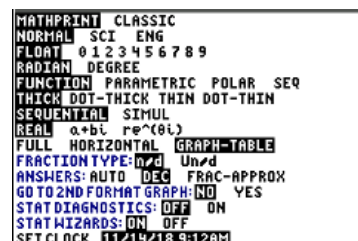
$$Y_1 = \frac{x+1}{2x+3}$$

The default axes are $-10 \leq x \leq 10$ and $-10 \leq y \leq 10$.



To view asymptotic behavior, it is helpful to use a table of values.

Press $[\text{mode}]$. Use the $[\leftarrow]$ $[\uparrow]$ $[\rightarrow]$ $[\downarrow]$ keys to place the cursor on GRAPH-TABLE in the Mode menu, and then press $[\text{enter}]$ to highlight it. Then place the cursor on DEC and press $[\text{enter}]$ to highlight it.



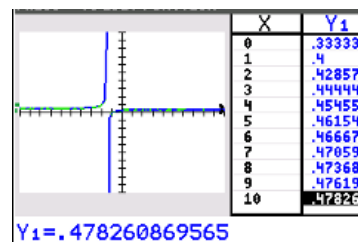
Press $[\text{2nd}]$ $[f5]$ $[\text{table}]$.

A table of values is displayed alongside the graph.

You can scroll through the table using $[\uparrow]$ and $[\downarrow]$ on the touchpad.

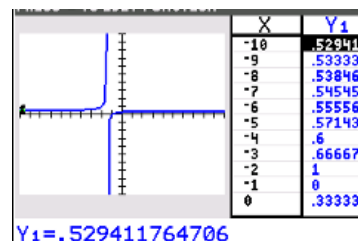
As x gets larger, the values of Y_1 are positive and approaching 0.5.

You can conclude that $x = 0$ is a horizontal asymptote.



Scroll up the table using $[\uparrow]$.

The values of Y_1 are negative and approaching 0.5. You can conclude that $x = 0.5$ is a horizontal asymptote.

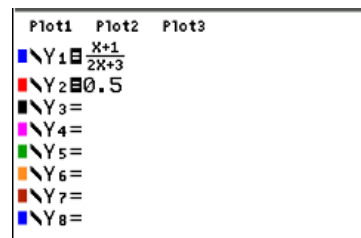


Chapter 4 / **Example 7**

Finding horizontal asymptotes

Return to the equation entry screen by pressing $[F1]$ $[Y=]$.

Type 0.5 and press $[ENTER]$ to enter the equation of the asymptote as Y_2 .



Press $[F5]$ $[GRAPH]$ to display the graph screen

The GDC now displays the function $Y_1 = \frac{X+1}{2X+3}$ and the asymptote $Y_2 = 0.5$.

