

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

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

Press **MENU** 5 **GRAPH** to display the equation entry screen.

Type $\frac{x+1}{2x+3}$ and press **EXE** to enter the equation as Y1.

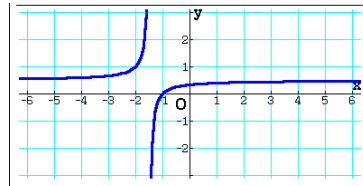
Use the fraction template  to enter the fraction.

Graph Func :Y=
Y1= $\frac{x+1}{2x+3}$ [—]
Y2: [—]
Y3: [—]
Y4: [—]
Y5: [—]
[SELECT] [DELETE] [TYPE] [TOOL] [MODIFY] [DRAW]

Press **F6** DRAW to display the graph screen.

The GDC now displays the function $Y1 = \frac{x+1}{2x+3}$

The default axes are $-6.3 \leq x \leq 6.3$ and $-3.1 \leq y \leq 3.1$.



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



Press **MENU** 7 **TABLE**. Press **F5** SET and change the settings so that the table starts from -6 and ends at 6.

Press **EXIT**.

Table Setting
X
Start: -6
End : 6
Step : 1

Press **F6** TABLE.

A table of values is displayed.


You can scroll through the table using  and .

As x decreases to -6 the value of $Y1$ is also decreasing and is approaching 0.5.

X	Y1
-6	0.5555
-5	0.5714
-4	0.6
-3	0.6666

-6

[FORMULA] [DELETE] [ROW] [EDIT] [GPH-CON] [GPH-PLT]

Scroll down the table using .

The values of $Y1$ are positive and approaching 0.5.

You can conclude that $x = 0.5$ is a horizontal asymptote.

X	Y1
3	0.4444
4	0.4545
5	0.4615
6	0.4666

6

[FORMULA] [DELETE] [ROW] [EDIT] [GPH-CON] [GPH-PLT]

Return to the equation entry screen by pressing **MENU** 5 **GRAPH**.

Type 0.5 and press **EXE** to enter the equation of the asymptote as Y2.

Graph Func :Y=
Y1= $\frac{x+1}{2x+3}$ [—]
Y2= 0.5 [—]
Y3: [—]
Y4: [—]
Y5: [—]
[SELECT] [DELETE] [TYPE] [TOOL] [MODIFY] [DRAW]

Chapter 4 / **Example 7**

Finding horizontal asymptotes

Press **F6** DRAW to display the graph screen

The GDC now displays the function $Y1 = \frac{x+1}{2x+3}$ and the asymptote $Y2 = 0.5$.

