Chapter 4 / **Example 17**
Drawing straight-line graphs

Draw the graph of the lines:
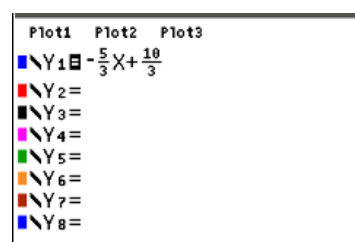
a $5x + 3y = 10$

b $y = \dfrac{1}{3}x + 4$

Press $[\text{f1}]$ $\boxed{\text{y=}}$ to display the equation entry screen.

Rearrange the equation in gradient-intercept form, type $-\dfrac{5}{3}x + \dfrac{10}{3}$ and press $\boxed{\text{enter}}$ to enter the first equation as Y_1.

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

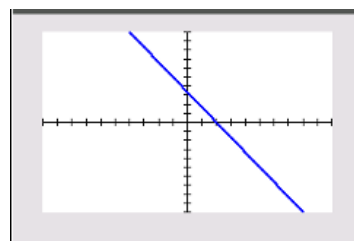Press $[\text{f5}]$ $\boxed{\text{graph}}$ to display the graph screen

The GDC now displays the straight-line graph:

$$Y_1 = -\dfrac{5}{3}x + \dfrac{10}{3}$$

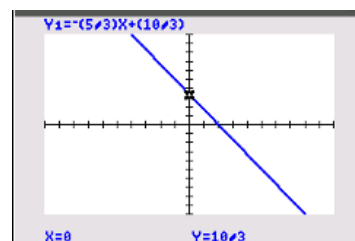With the default axes, $-10 \le x \le 10$ and $-10 \le y \le 10$.

The *x*-intercept is a zero of the function.

To find the *y*-intercept press $\boxed{\text{2nd}}$ $[\text{f4}]$ $\boxed{\text{calc}}$ 1:value

Press $\boxed{0}$ $\boxed{\text{enter}}$ to change the *x*-coordinate to 0.

The GDC displays the coordinates of the *y*-intercept, $\left(0, \dfrac{10}{3}\right)$.

To find the zeros press $\boxed{\text{2nd}}$ $[\text{f4}]$ $\boxed{\text{calc}}$ 2:zero

You will need to give the left and right bounds of the region that includes the zero.

The GDC shows a point on the curve and asks you to set the left bound. Move the point using $\boxed{\blacktriangleright}$ $\boxed{\blacktriangleleft}$ and choose a position to the left of the zero.
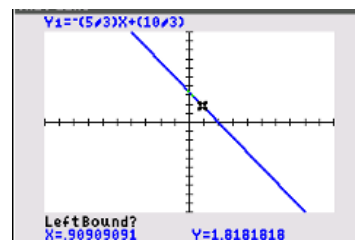
Press $\boxed{\text{enter}}$.

The GDC shows a line where you have set the left bound and a point on the curve.

Move the point using $\boxed{\blacktriangleright}$ $\boxed{\blacktriangleleft}$ and choose a position to the right of the zero.

When the region contains the zero, Press $\boxed{\text{enter}}$.
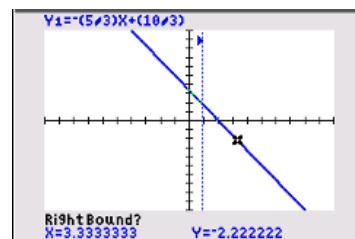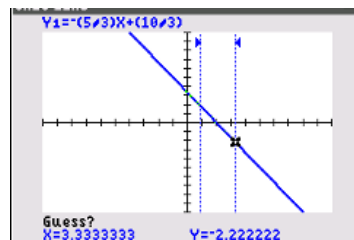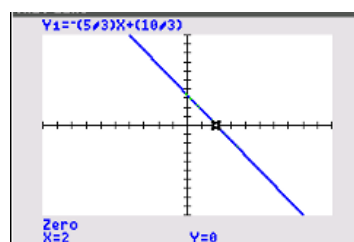

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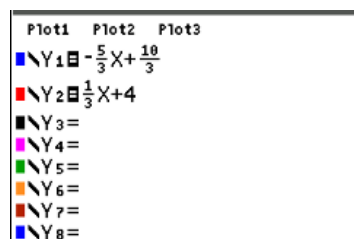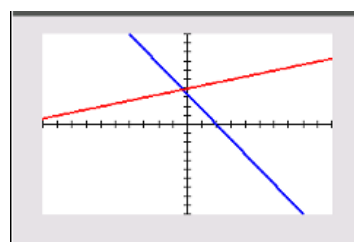|	
The GDC requires an initial guess for the position of the zero. Choose the default position. Press enter .	$Y_1='(5/3)X+(10/3)$ Guess? X=3.3333333 Y=-2.222222
The GDC displays a zero at $(2,0)$.	$Y_1='(5/3)X+(10/3)$ Zero X=2 Y=0
To draw the line $y = \dfrac{1}{3}x + 4$ press [f1] y= to display the equation entry screen. Type $\dfrac{1}{3}x + 4$ and press enter to enter the second equation as Y_2. Press ALPHA [f1] 1:n/d to select the fraction template to enter the fractions.	Plot1 Plot2 Plot3 Y1 = $-\frac{5}{3}$X+$\frac{10}{3}$ Y2 = $\frac{1}{3}$X+4 Y3= Y4= Y5= Y6= Y7= Y8=
Press [f5] graph to display the graph screen. The GDC now displays the straight-line graph $Y_2 = \dfrac{1}{3}x + 4$ With the default axes, $-10 \le x \le 10$ and $-10 \le y \le 10$.	
To find the y-intercept press 2nd [f4] [calc] 1:value Press 0 enter to change the x-coordinate to 0. Press ▲ to select the function Y_2. The GDC displays the coordinates of the y-intercept, $(0,4)$.	Y2=1/3X+4 X=0 Y=4
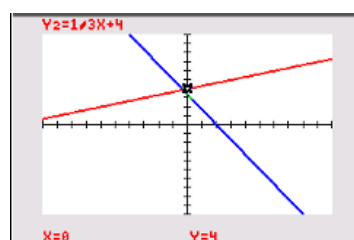
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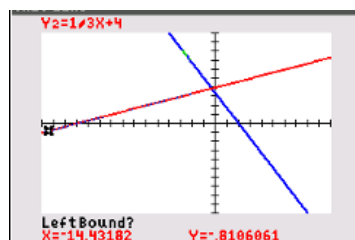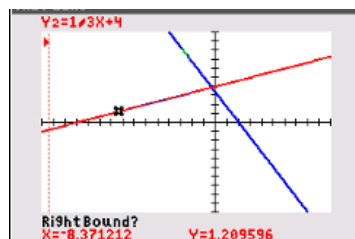|	
To view the zero of Y2 you will need to change the axes to include points further to the left. Press $\boxed{f2}$ $\boxed{window}$ Change Xmin to −15 and leave the other items as they are. Press $\boxed{f5}$ $\boxed{graph}$ when you have finished.	```WINDOW Xmin=-15 Xmax=10 Xscl=1 Ymin=-10 Ymax=10 Yscl=1 Xres=1 ΔX=.09469696969697 TraceStep=.18939393939394```
The *x*-intercept is a zero of the function. To find the zeros press $\boxed{2nd}$ $\boxed{f4}$ $\boxed{calc}$ 2:zero Press $\boxed{\blacktriangle}$ to select the function Y_2. You will need to give the left and right bounds of the region that includes the zero. The GDC shows a point on the curve and asks you to set the left bound. Move the point using $\boxed{\blacktriangleright}$ $\boxed{\blacktriangleleft}$ and choose a position to the left of the zero. Press $\boxed{enter}$.	Y₂=1/3X+4 LeftBound? X=-14.43182 Y=-.8106061
The GDC shows a line where you have set the left bound and a point on the curve. Move the point using $\boxed{\blacktriangleright}$ $\boxed{\blacktriangleleft}$ and choose a position to the right of the zero. When the region contains the zero, Press $\boxed{enter}$.	Y₂=1/3X+4 RightBound? X=-8.371212 Y=1.209596
The GDC requires an initial guess for the position of the zero. Choose the default position. Press $\boxed{enter}$.	Y₂=1/3X+4 Guess? X=-8.371212 Y=1.209596
The GDC displays a zero at $(-12, 0)$.	Y₂=1/3X+4 Zero X=-12 Y=0