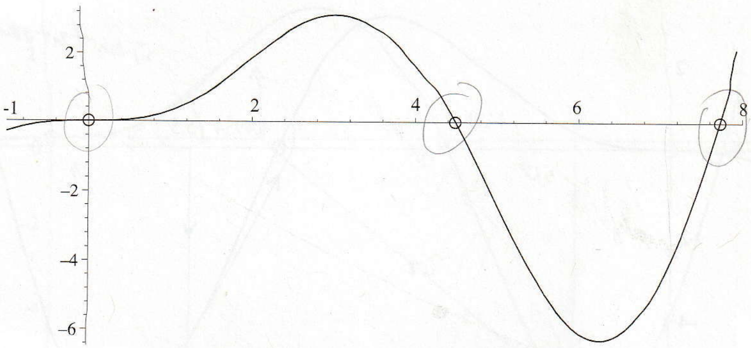

Figure 3.8: *Graph of the function* $f(x) = \sin x - x\cos x$ *on the interval* $[-1, 8]$*, showing the three roots of the equation* $\sin x - x\cos x = 0$ *in that interval.*

method. However, to illustrate what can go wrong, consider using $x_0 = 6$ in the present example. The algorithm produces a sequence of approximations that converges to the root $x = 0$, rather than the root $x = r \approx 4.4934$. This may have surprised you! The plot in Figure 3.10 graphically illustrates this.

Exercise Set 3

blz 48

1. The following are variations of the code used in Examples 3.1–3.2 to compute Riemann sums. Analyze what each does and give the mathematical formula for what it is actually computing.

   N := 10

   (a)
   ```
   dX:=(b-a)/N; X:=a; Y:=f(a); s:=0;
   for i from 1 to N do
       X:= X+dX; Y:=f(X);
       s:= s+Y*dX;
   end do;
   ```
   geen instatements
   (linker hand riemann som)

   (b)
   ```
   X:=array(0..N); Y:=array(0..N);
   dX:=(b-a)/N; X[0]:=a; Y[0]:=f(X[0]); s:=0;
   for i from 1 to N do
       X[i]:= X[i-1]+dX; Y[i]:=f(X[i]);
       s:= s+Y[i-1]*dX;
   end do;
   ```
   wel instatement + gebruik v. arrays

   - blz 49 - via linker riemann som

2. **(Riemann Sums)** As in Example 3.2, write some code to compute the Riemann sum approximations and draw the outline (boundary) of the approximating areas for the following situations.