Approximating Maximum and Minimum Points

In Exercises 79–84, (a) use a graphing utility to graph the function and approximate the maximum and minimum points on the graph in the interval $[0, 2\pi)$, and (b) solve the trigonometric equation and demonstrate that its solutions are the x-coordinates of the maximum and minimum points of f. (Calculus is required to find the trigonometric equation.)

83. $f(x) = \sin x \cos x$ $\qquad -\sin^2 x + \cos^2 x = 0$

84. $f(x) = \sec x + \tan x - x$ $\quad \sec x \tan x + \sec^2 x = 1$
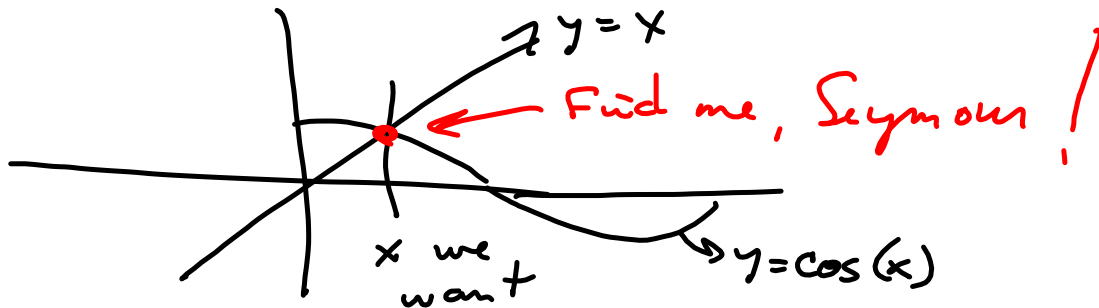
Has vertical asymptotes in the specified domain, so no max/min values.
$\exists$ some LOCAL max/min values, though

Fixed Point In Exercises 97 and 98, find the smallest positive fixed point of the function f. [A *fixed point* of a function f is a real number c such that f(c) = c.]
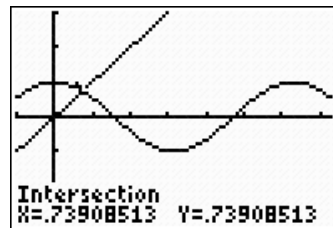
98. $f(x) = \cos x$
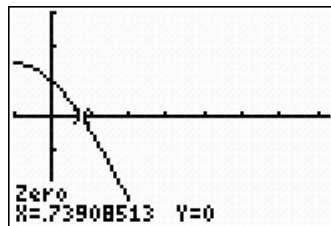
fixed Point means $f(x) = x$

So solve $\cos(x) = x$

$y = x$

Find me, Seymour!

x we want

$y = \cos(x)$

Plot1 Plot2 Plot3
```
\Y1◨cos(X)
\Y2◨X
\Y3=■
\Y4=
\Y5=
\Y6=
\Y7=
```

Intersection
X=.73908513 Y=.73908513

$\cos x = x$

TI-84

Plot1 Plot2 Plot3
```
\Y1◨cos(X)-X
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

Zero
X=.73908513 Y=0

$\cos x - x = 0$

$evalf\left(solve(\cos(x) = x)\right) \approx$ 0.7390851332   MAPLE

evaluate, floating point
decimal