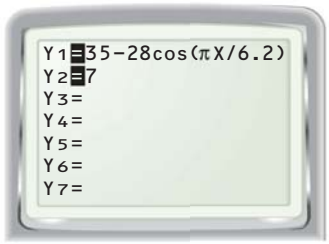
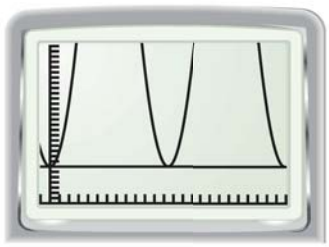
METHOD 2

Using a Graph Another approach is to use a graph to solve the equation $35 - 28 \cos \frac{\pi}{6.2}t = 7$. You can use a graphing calculator to make the graph.

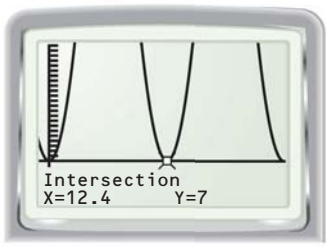
STEP 1 **Enter** the functions $y = 35 - 28 \cos \frac{\pi}{6.2}x$ and $y = 7$ into a graphing calculator. Again, note that time is now represented by x and water depth is now represented by y.



STEP 2 **Graph** the functions. Set your calculator in radian mode. Adjust the viewing window so that you can see where the graphs intersect on the interval $0 \le x \le 24$.



STEP 3 **Find** the intersection points of the two graphs using the *intersect* feature of the graphing calculator. On the interval $0 \le x \le 24$, the graphs intersect at (0, 7) and (12.4, 7). Because x represents the number of hours since midnight, you know that the water depth is 7 feet at midnight and 12:24 P.M.



PRACTICE

SOLVING EQUATIONS **Solve the equation using a table and using a graph.**

1. $20 \sin \frac{\pi}{4}x - 6 = 8$
2. $5 \cos \frac{\pi}{6}x + 6 = 2$
3. $-10 \cos 2\pi x = 3$
4. $3 + 4 \sin \frac{\pi}{2}x = 2$
5. $-15 - 10 \sin \frac{\pi}{20}x = -11$
6. $-34 \cos \frac{\pi}{5}\left(x - \frac{\pi}{10}\right) + 22 = 17$
7. **WHAT IF?** In the problem on page 938, suppose you want to find the time(s) when the depth of the water in the Bay of Fundy is 15 feet. Find the time(s) using a table and using a graph.
8. **WRITING** *Explain* why the equation $2 \sin x + 3 = 0$ has no solution. How does a graph show this?
9. **BUOY** An ocean buoy bobs up and down as waves travel past it. The buoy's displacement d (in feet) with respect to sea level can be modeled by $d = 3 \sin \pi t$ where t is the time (in seconds). During the one second interval $0 \le t \le 1$, when is the buoy 1.5 feet above sea level? Solve the problem using a table and using a graph.