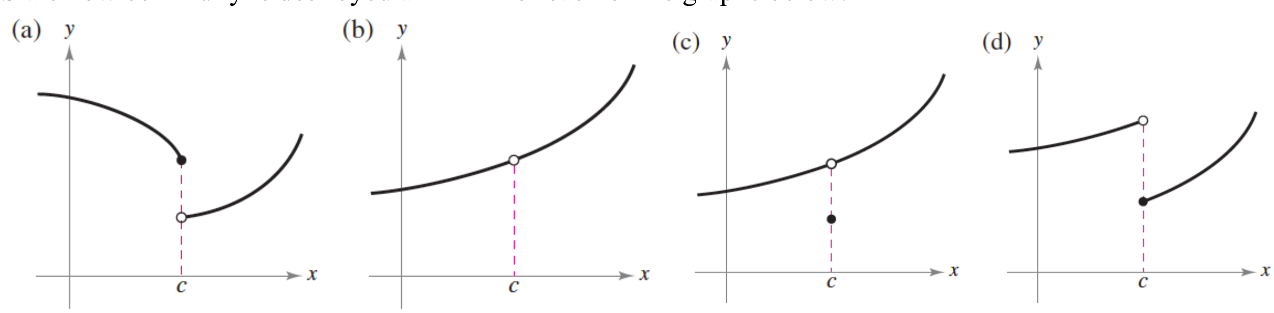
In 1-4, explain why the function has a zero in the given interval.	
1	$f(x)=\frac{1}{16}x^4-x^3+3$; $[1,2]$
2	$f(x)=x^3+3x-2$; $[0,1]$
3	$f(x)=x^2-x-\cos x$; $[0,\pi]$
4	$f(x)=-\frac{4}{x}+\tan\left(\frac{\pi x}{8}\right)$; $[1,3]$

In 5-8, verify that the Intermediate Value Theorem guarantees that there is a zero in the interval $[0,1]$ for the given function. Use a graphing calculator to find the zero.	
5	$f(x)=x^3+x-1$
6	$f(x)=x^3+3x-2$
7	$g(t)=2\cos t-3t$
8	$h(\theta)=1+\theta-3\tan\theta$

In 9-12, verify that the Intermediate Value Theorem applies to the indicated interval and find the value of *c* guaranteed by the theorem. No calculator is permitted on these problems.	
9	$f(x)=x^2+x-1$, $[0,5]$, $f(c)=11$
10	$f(x)=x^2-6x+8$, $[0,3]$, $f(c)=0$
11	$f(x)=x^3-x^2+x-2$, $[0,3]$, $f(c)=4$
12	$f(x)=\frac{x^2+x}{x-1}$, $\left[\frac{5}{2},4\right]$, $f(c)=6$

13 State how continuity is destroyed at $x=c$ for each of the graphs below:



14 Use the Intermediate Value Theorem to show that for all spheres with radii in the interval $[1,5]$, there is one with a volume of 275 cubic centimeters.

15 Show that $f(x)$ is continuous at $x=2$ for $f(x)=\begin{cases}5-x, & -1\le x\le 2\\ x^2-1, & 2<x\le 3\end{cases}$.

16 Determine whether $f(x)$ is continuous at $x=-1$ for $f(x)=\begin{cases}\frac{1}{x}, & x\le -1\\ \frac{x-1}{2}, & -1<x<1\\ \sqrt{x}, & x\ge 1\end{cases}$