

(Note - \*\* problems are optional)

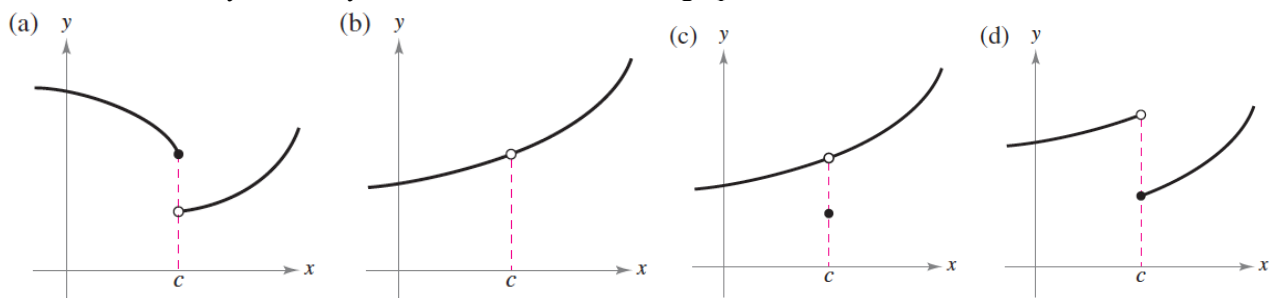
In 1-4, verify that the Intermediate Value Theorem guarantees that there is a zero in the interval for the given function. Use a graphing calculator to find the zero.

1	$f(x) = \frac{1}{16}x^4 - x^3 + 3; [1, 2]$
2	$f(x) = x^3 + 3x - 2; [-2, 1]$
3	$f(x) = x^2 - x - \cos x; [0, \pi]$
**4	$f(x) = x^3 + x - 1; [-1, 1]$

In 5-7, 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.

5	$f(x) = x^2 + x - 1, [0, 5], f(c) = 11$
6	$f(x) = x^2 - 6x + 8, [0, 3], f(c) = 5$
**7	$f(x) = x^3 - x^2 + x - 2, [0, 3], f(c) = 4$

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



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