1.16 Intermediate Value Theorem (IVT)

Calculus Name: _____ **CA #2**

Below is a table of values for a continuous function g.

x	0	5	13	28	50
$g(x)$	-4	8	20	11	-15

1. What is the minimum number of zeros g must have on the interval $0 \le x \le 50$?

2. For $5 \le x \le 28$, what is the fewest possible number of times $f(x) = 10$?

3. On the interval $28 \le x \le 50$, must there be a value of x for which $g(x) = -10$? Explain.

4. For $0 \le x \le 28$, what is the fewest possible number of times $f(x) = 5$?

Below is a table of values for a continuous function f.

x	-12	-6	-1	30	40
$f(x)$	6	30	-40	-10	10

5. On the interval $-12 \le x \le 40$ what is the minimum number of zeros?

6. For $-1 \le x \le 40$, what is the fewest possible number of times $f(x) = 15$?

7. For $-12 \le x \le -1$, what is the fewest possible number of times $f(x) = 3$?

8. On the interval $-1 \le x \le 40$, must there be a value of x for which $f(x) = 9$? Explain.

Use the Intermediate Value Theorem to answer each problem.

9. If $f(x) = 3x^2 - 5x - 2$, will $f(x) = -1$ on the interval $[0, 3]$? Explain.

10. If $g(x) = 7x^3 - 5x$, will $g(x) = 20$ on the interval $[-1, 2]$? Explain.

Answers to 1.16 CA #2

1. 2	2. 1	3. $f(28) = 11, f(50) = -15$. By the IVT, there is a value c such that $f(c) = -10$ and $28 \le c \le 50$.	4. 1	5. 2	6. 0	7. 1
8. $f(-1) = -40, f(40) = 10$. By the IVT, there is a value c such that $f(c) = 9$ and $-1 \le c \le 40$.		9. $f(0) = -2, f(3) = 10$. By the IVT, there is a value c such that $f(c) = -1$ and $0 \le c \le 3$.		10. $g(-1) = -2, g(2) = 46$. By the IVT, there is a value c such that $g(c) = 20$ and $-1 \le c \le 2$.		