Calculus **Name: ______________________________**

HW 13: Unit 2.6 – IVT (Intermediate Value Theorem) & Squeeze (Sandwich) Theorem

Use the Squeeze (Sandwich) Theorem to evaluate the following limits.

1. If $3x \leq f(x) \leq x^3 + 2$ on $[0, 2]$, evaluate $\lim_{x\to 1} f(x)$

2. Evaluate $\lim_{x\to 4} f(x)$ if, for all x,
$4x - 9 \leq f(x) \leq x^2 - 4x + 7$

3. $\lim_{x\to 0} x^3 Sin\left(\frac{1}{x}\right)$

4. $\lim_{x\to 0} x^2 Cos\left(\frac{1}{x^2}\right)$

5. $\lim_{x\to 0} 49x Cos\left(\frac{7}{3m}\right)$

6. $\lim_{x\to \infty} \frac{5+8Cos(5x)}{12x+5}$

7. For all $y \in [-1,1]$, $\sqrt{y^8 + 7} \leq f(y) \leq \sqrt{4y^8 + 7}$. Find $\lim_{y\to 0}(f(y) + 25)$.

Use the **Intermediate Value Theorem** to show that the equation has at least one solution in the given interval.

8. $f(x) = \frac{1}{16}x^4 - x^3 + 3;\ [1, 2]$

9. $x^3 + 3x = 2;\ [0, 1]$

10. $f(x) = x^2 - x - \cos x;\ [0, \pi]$

11. $f(x) = x^3 + x - 1;\ [0, 1]$