Your Name: Key

Calculus I, Math 151-06, Quiz #4

1. **[6 points]** Differentiate the function $f(t) = \cos^7(t)$.

$$f'(t) = 7\cos^6(t) \cdot (-\sin t)$$

2. **[6 points]** Differentiate the function $g(q) = \sec(q^7)$.

$$g'(q) = \sec(q^7)\tan(q^7) \cdot 7q^6$$

3. **[7 points]** Differentiate the function $h(\theta) = \cos\left(\dfrac{\theta}{\cos(\theta)}\right)$.

$$h'(\theta) = -\sin\left(\frac{\theta}{\cos\theta}\right) \cdot \left(\frac{\cos\theta \cdot (1) - \theta(-\sin\theta)}{\cos^2\theta}\right)$$

4. **[6 points]** Differentiate the function $r(z) = (z^5 - 4z^2 + 7)^4(2z^3 + 5z + 12)^7$.

$$r'(z) = (z^5 - 4z^2 + 7)^4\left[7(2z^3 + 5z + 12)^6(6z^2 + 5)\right] + \left[4(z^5 - 4z^2 + 7)^3(5z^4 - 8z)\right](2z^3 + 5z + 12)^7$$