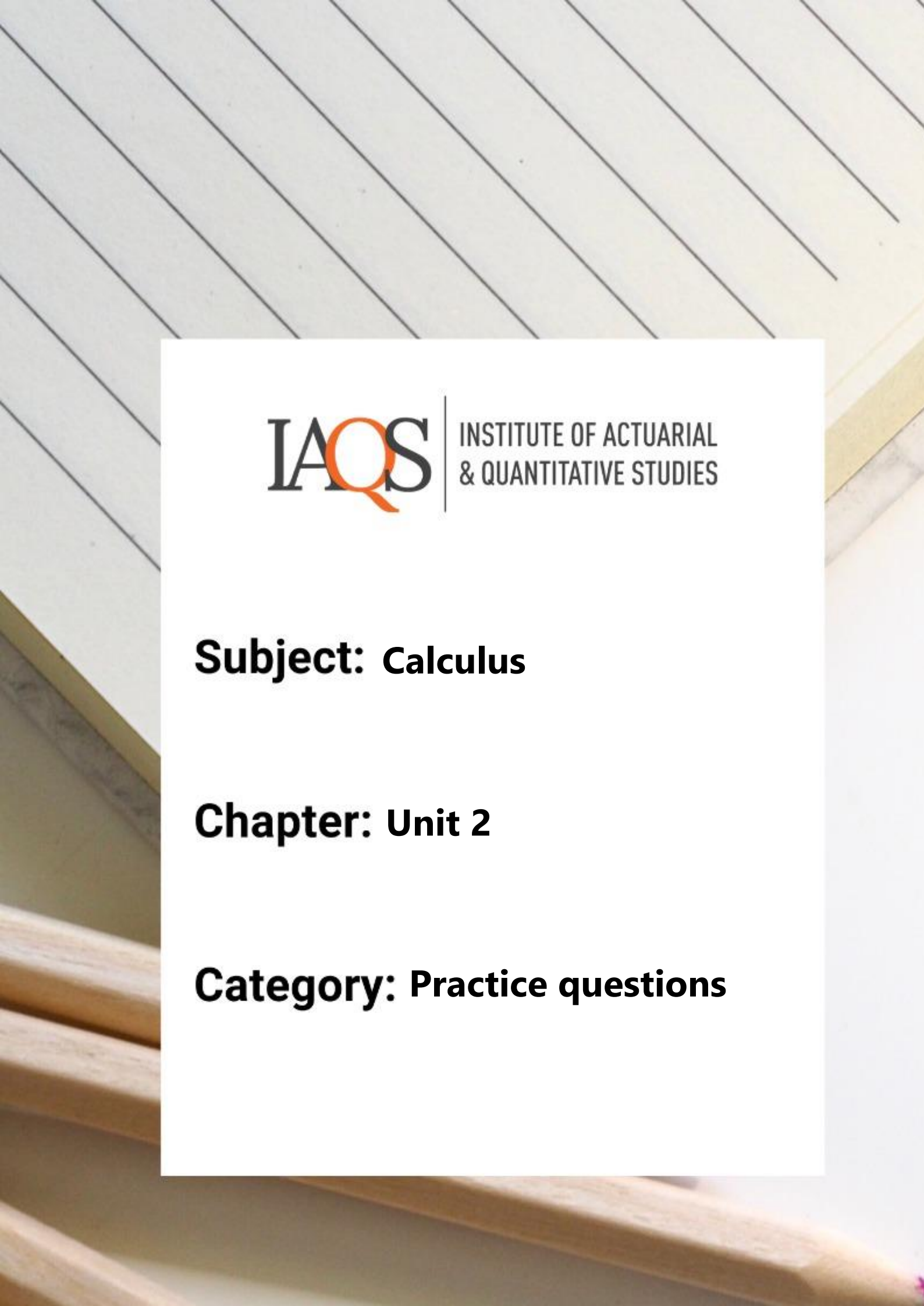

INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

Subject: Calculus

Chapter: Unit 2

Category: Practice questions

For problems below find the derivative of the given function.

1. f (x) = $6x^3-9x+4$

2. y = $2t^4-10t^2+13t$

3. g (z) = $4z^7-3z^{-7}+9z$

4. f (x) = $10\sqrt[5]{x^3} - \sqrt{x^7} + 6\sqrt[3]{x^8} - 3$

5. $f(t) = \frac{4}{t} - \frac{1}{6t^3} + \frac{8}{t^5}$

6. $R(z) = \frac{6}{\sqrt{z^3}} + \frac{1}{8z^4} - \frac{1}{3z^{10}}$

7. z = $x(3x^2 - 9)$

8. g(y) = (y - 4) $(2y + y^2)$

9. h(x) = $\frac{4x^3-7x+8}{x}$

10. f (t) = $(4t^2 - t)$ $(t^3 - 8t^2 + 12)$

11. y = $(1+\sqrt{x^3})$ $(x^{-3} - 2\sqrt[3]{x})$

12. g(x) = $\frac{6x^2}{2-x}$

13. R(w) = $\frac{3w+w^4}{2w^2+1}$

14. $R(w) = 3^w \log(w)$

15. $y = z^5 - e^z \ln(z)$

16. $f(x) = (6x^2 + 7x)^4$

17. $f(t) = 5 + e^{4t+t^7}$

18. Find two positive numbers whose product is 750 and for which the sum of one and 10 times the other is a minimum

19. Determine the critical points of $f(x) = 5x\, e^{9-2x}$

20. The graph of a function is given below. Determine the intervals on which the function increases and decreases.