

MAC 2311 EXAM II TOPICS (8th Ed.)

- 3.1 ① slopes of secant and tangent lines, average and instantaneous velocities (or rates of change) (15)
- 3.2 ② Derivative from the definition (the one with "h") (10)
- 3.2 ③ Non-differentiability (5)
- 3.3, 3.4 ④ Power rule, product rule, quotient rule, higher derivatives. (15)
- 3.5 ⑤ Derivatives of trig. functions (10)
- 3.6 ⑥ Chain Rule (15)
- 3.7 ⑦ Related Rates (15)
- 3.8 ⑧ Increments, differentials, local linear approximations, error propagation in applications. (15)

Note! Point values are in parentheses.

(1) $\int_{-\infty}^{\infty} \delta(x) dx = 1$

(2) $\int_{-\infty}^{\infty} x \delta(x) dx = 0$

(3) $\int_{-\infty}^{\infty} x^n \delta(x) dx = 0$ for $n > 0$

(4) $\int_{-\infty}^{\infty} \delta(x-a) dx = 1$

(5) $\int_{-\infty}^{\infty} x \delta(x-a) dx = a$

(6) $\int_{-\infty}^{\infty} x^n \delta(x-a) dx = a^n$

(7) $\int_{-\infty}^{\infty} \delta(x) f(x) dx = f(0)$

(8) $\int_{-\infty}^{\infty} \delta(x-a) f(x) dx = f(a)$

(9) $\int_{-\infty}^{\infty} \delta(x) f'(x) dx = -f'(0)$

(10) $\int_{-\infty}^{\infty} \delta(x-a) f'(x) dx = -f'(a)$

(11) $\int_{-\infty}^{\infty} \delta(x) f''(x) dx = f''(0)$

(12) $\int_{-\infty}^{\infty} \delta(x-a) f''(x) dx = f''(a)$

(13) $\int_{-\infty}^{\infty} \delta(x) f'''(x) dx = -f'''(0)$

(14) $\int_{-\infty}^{\infty} \delta(x-a) f'''(x) dx = -f'''(a)$

(15) $\int_{-\infty}^{\infty} \delta(x) f^{(4)}(x) dx = f^{(4)}(0)$

(16) $\int_{-\infty}^{\infty} \delta(x-a) f^{(4)}(x) dx = f^{(4)}(a)$

(17) $\int_{-\infty}^{\infty} \delta(x) f^{(5)}(x) dx = -f^{(5)}(0)$

(18) $\int_{-\infty}^{\infty} \delta(x-a) f^{(5)}(x) dx = -f^{(5)}(a)$

(19) $\int_{-\infty}^{\infty} \delta(x) f^{(6)}(x) dx = f^{(6)}(0)$

(20) $\int_{-\infty}^{\infty} \delta(x-a) f^{(6)}(x) dx = f^{(6)}(a)$

(21) $\int_{-\infty}^{\infty} \delta(x) f^{(7)}(x) dx = -f^{(7)}(0)$

(22) $\int_{-\infty}^{\infty} \delta(x-a) f^{(7)}(x) dx = -f^{(7)}(a)$

(23) $\int_{-\infty}^{\infty} \delta(x) f^{(8)}(x) dx = f^{(8)}(0)$

(24) $\int_{-\infty}^{\infty} \delta(x-a) f^{(8)}(x) dx = f^{(8)}(a)$

(25) $\int_{-\infty}^{\infty} \delta(x) f^{(9)}(x) dx = -f^{(9)}(0)$

(26) $\int_{-\infty}^{\infty} \delta(x-a) f^{(9)}(x) dx = -f^{(9)}(a)$