
MAT 145: Test #4 – Part 1 (20 points)

Name _____ Section: _____ Score _____

Part I: Do Not Use Any Calculator or Computer Tools!

State the derivative of each function. Each derivative should be written as an explicit function of x , when possible. Otherwise, it is not necessary to simplify. Show evidence of calculations.

Each derivative should start with $y' =$ or $\frac{dy}{dx} =$. (#1 through #7: 1 pt each; #8: 3 pts)

(1) $y = 3x^2$ _____

(2) $y = e\pi^x$ _____

(3) $y = \sqrt[3]{2x}$ _____

(4) $y = x^3 \tan x$ _____

(5) $y = x^{3e+4}$ _____

(6) $y = \ln(x)$ _____

(7) $y = \frac{3 - \cos x}{e^x}$ _____

(8) $y = (\cos x)^{2x}$ _____

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Determine the indefinite integral (family of antiderivatives) for each function. (1 pt each)

(9) $\int 5x^6 dx$ _____

(10) $\int e^{2t} dt$ _____

(11) $\int 7 dx$ _____

(12) $\int \frac{2}{x} dx$ _____

(13) $\int \sin t dt$ _____

(14) $\int (\ln 11) 11^m dm$ _____

Evaluate each definite integral. Show calculations to support your answer. Simplify if possible. (1 pt each)

(15) $\int_0^2 x^2 dx$ _____

(16) $\int_1^4 2t + 1 dt$ _____

(17) $\int_0^{\frac{\pi}{2}} \cos \theta d\theta$ _____

(18) $\int_0^1 e^x dx$ _____