

Mathematics I

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Final Exam
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1. Find the derivatives dy/dx .

a) $y = \arctan e^{2x}$

b) $y = \frac{\cos^2 x^3}{\ln x}$

2. Evaluate the integrals of $f(x) dx$.

a) $f(x) = \frac{e^{\sqrt{x}}}{\sqrt{x}}$

b) $f(x) = \frac{\cos x}{\sin x}$

c) $f(x) = \frac{1}{4+x^2}$

3. Sketch the graph given by the parametric equation.

$$\begin{aligned}y &= \sin t \\x &= \cos t \\ \frac{\pi}{2} &\leq t \leq \frac{\pi}{2}\end{aligned}$$

4. A coin is tossed 4 times. Draw a table for the binomial probability distribution of the number of Heads.

5. The marks of a Mathematics exam fit a Normal distribution with mean = 12 and standard deviation = 2. If 40 students took the exam, estimate how many of them have marks between 9 and 15. You need the value $P(X \leq 1.50) = 0.9332$.

6. Find the correlation coefficient and the regression equation for the hypothetical data given below.

X	Y
1	3
1	5
2	1
2	2
2	3