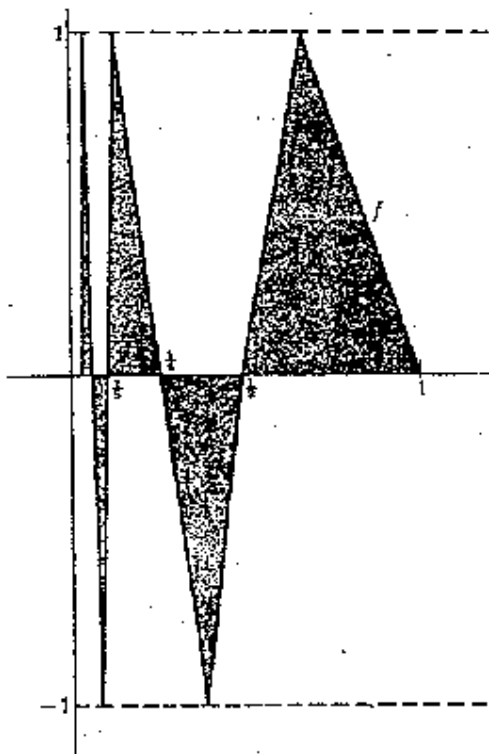


國立中央大學八十八學年度碩士班研究生入學試題卷

所別: 工業管理研究所 甲組 科目: 微積分 共 1 頁 第 1 頁

- (20%) Integration by parts.
a) $\int \sec^3 x \, dx$, b) $\int \sqrt{x} \log x \, dx$.
- (20%) Find the Taylor series at 0 for each of the following functions:
a) $f(x) = \frac{1}{x-a}$, $a \neq 0$ b) $f(x) = \arcsin x$
- (20%) If $f(x) = (\sin x)/x$ for $x \neq 0$ and $f(0) = 1$, find $f^{(k)}(0)$. Hint: Find the power series for f .
- (20%) Prove that $|z+w|^2 + |z-w|^2 = 2(|z|^2 + |w|^2)$, and interpret this statement geometrically.
- (20%) Let f be the function shown below. Find $\int_0^1 f$, and also the area of the shaded region in the figure.



參考用