2005 Fall MTH142
Final Exam 2 Answers

A1 (a) $v(t) = -32t + 48$

(b) $s(t) = -16t^2 + 48t + 64$

(c) 100 ft

(d) 4 s

A2 (a) $\cos x$

(b) $3x^2 \ln x - \ln x$

(c) 4

(d) 2

A3 (a) $e^{\tan x} + C$

(b) $\ln|\ln x| + C$

(c) $\frac{1}{10}\left(x^4+8\right)^{\frac{5}{2}} - \frac{4}{3}\left(x^4+8\right)^{\frac{3}{2}} + C$

A4 (a) $\int_0^1 \left[\pi\left(2-x^2\right)^2 - \pi(2-x)^2\right]\,dx$

(b) $\int_0^1 2\pi(2-y)\left(\sqrt{y}-y\right)\,dy$

A5 (a) $xe^x - e^x + C$

(b) $x\ln x - x + C$

(c) $-x^2\cos x + 2x\sin x + 2\cos x + C$

B1 (a) $\frac{1}{7}\sin^7 x - \frac{1}{9}\sin^9 x + C$

(b) $\frac{1}{10}\sec^{10} x - \frac{1}{4}\sec^8 x + \frac{1}{6}\sec^6 x + C$

(c) $\frac{3}{8}x + \frac{1}{4}\sin(2x) + \frac{1}{32}\sin(4x) + C$

(d) $\frac{1}{2}\sin x - \frac{1}{10}\sin(5x) + C$

B2 (a) $\ln\left|\frac{\sqrt{x^2+25}}{5} + \frac{x}{5}\right| + C$

(b) $\arcsin(x-3) + C$

B3 (a) $x^2 + x + \frac{x^2+1}{x^3+1}$

(b) $A = 0,\ B = 1,\ C = 1,\ D = 2$

(c) $\dfrac{A}{x}+\dfrac{B}{x^2}+\dfrac{C}{x^3}+\dfrac{D}{x+1}+\dfrac{E}{x-1}+\dfrac{Fx+G}{x^2+4}+\dfrac{Hx+I}{(x^2+4)^2}$

B4 (a) $M_6 = 2\left(\sin 1+\sin 9+\sin 25+\sin 49+\sin 81+\sin 121\right)$

(b) $T_6 = \dfrac{2}{2}\left(\sin 0+2\sin 4+2\sin 16+2\sin 36+2\sin 64+2\sin 100+\sin 144\right)$

(c) $S_6 = \dfrac{2}{3}\left(\sin 0+4\sin 4+2\sin 16+4\sin 36+2\sin 64+4\sin 100+\sin 144\right)$

B5 (a) $\dfrac{1}{2}$

(b) $+\infty$

B6 $\dfrac{3}{4}+\dfrac{\ln 2}{2}$

B7 (a) $\ln|x-1|-\ln|x+1|+C$

(b) $\dfrac{1}{2}e^x\left(\sin x+\cos x\right)+C$

(c) $-\dfrac{1}{e^x+1}+C$

(d) $x\arctan x-\dfrac{1}{2}\ln\left(x^2+1\right)+C$