a) is a Solution, Master Code

Math 102 Final Exam Term 212

1. Using the method of cylindrical shell, the volume of the solid generated by revolving about the $x$-axis the region bounded by $x = 1 + (y-2)^2$; $x = 2$, is equal to:

a) $\frac{16}{3}\pi$

b) $\frac{2}{3}\pi$

c) $\frac{4}{3}\pi + 2$

d) $5\pi + \frac{1}{4}$

e) $2\pi + 3$

2. The average value of $f(x) = x\sin(x^2)$ over $[0, 10]$ is equal to

a) $\frac{1}{20}(1 - \cos 100)$

b) $\frac{1}{10}(\cos 10 - 1)$

c) $\frac{1}{10}(\cos 1 - 1)$

d) $\frac{1}{20}(\sin 100 - 1)$

e) $\frac{1}{10}(\sin 10 - 1)$

3. $\int_0^{1/2} \cos^{-1} x \, dx =$

a) $\frac{\pi}{6} + 1 - \frac{\sqrt{3}}{2}$

b) $\frac{\pi}{6} + \frac{\sqrt{3}}{2}$

c) $\frac{\pi}{3} - 1$

d) $\frac{\pi}{3} + 1$

e) $\frac{1}{2}\left(\frac{\pi}{3} - 1\right)$

4. $\int \frac{dx}{\sqrt{x^2 - 6x + 13}} =$

a) $\ln|\sqrt{x^2 - 6x + 13} + x - 3| + c$

b) $\frac{1}{2}\ln|x^2 - 5x + 10| + c$

c) $\ln|\sqrt{x^2 - x} + x + 13| + c$

d) $\ln|(x-3)^2 + 4| + c$

e) $\ln|(x-3)^2 + 4x| + c$