SECTION A

1	A	B	C	D	
2	A	B		D	E
3	A		C	D	E
4	A	B	C	D	
5	A	B		D	E
6	A	B		D	E
7		B	C	D	E
8	A	B	C		E
9	A	B		D	E
10	A		C	D	E
11	A	B	C	D	
12	A	B	C		E
13	A	B	C		E
14	A	B		D	E
15	A	B	C		E
16	A	B	C	D	
17	A	B		D	E
18		B	C	D	E
19	A		C	D	E
20		B	C	D	E
21	A		C	D	E
22	A		C	D	E
23	A	B	C		E
24	A	B		D	E
25		B	C	D	E
26	A	B	C		E
27		B	C	D	E
28	A	B	C		E
29	A	B	C	D	
30	A		C	D	E
31		B	C	D	E
32	A	B	C	D	
33		B	C	D	E

Copyright © 1995 MAV

SECTION B

Question 1

a. $2x + h = 3 \Leftrightarrow h = 3 - 2x$ A1

b. $S = 4x^2 + 4x(3-2x) = 12x - 4x^2 \Rightarrow \frac{dS}{dx} = 12 - 8x$ M1

Now, $\frac{dS}{dx} = 0 \Leftrightarrow x = \frac{12}{8} = 1.5$ A1

(Use either sign of first derivative or graph to show local maximum occurs) A1

Question 2

$y = \log_e(x^2+1) \Rightarrow \frac{dy}{dx} = \frac{2x}{x^2+1}$ M1 A1

When x = 1, $\frac{dy}{dx} = \frac{2}{2} = 1$ A1

Question 3

a. a = 3, b = 2 A1

b. Area $= \int_0^{3\pi} (3 + 2\sin(2x))dx = [3x - \cos(2x)]_0^{3\pi}$ M1

$= (9\pi - cos(6\pi)) - (0 - cos(0))$

$= 9\pi - 1 + 1 = 9\pi$ A1

Question 4

a. $X \overset{d}{=} Bin(10, 0.3)$.

Therefore, $P(X \geq 1) = 1 - P(X = 0) = 1 - {}^{10}C_0(0.3)^0(0.7)^{10} = 0.972$ M1

b. Assumption: each trial is independent and identical to the previous one. A1

Copyright © 1995 MAV

Question 5

a. $(0 + 0.1) + (k + 0.1) + (2k + 0.1) + (3k + 0.1) = 1.$

Therefore, $6k + 0.4 = 1$. That is $k = 0.1$. A1

b. $E(X) = 0(0.1) + 1(0.2) + 2(0.3) + 3(0.4) = 2$ M1 A1

Question 6

Let X be the score obtained by students, therefore $X \overset{d}{=} N(65,81)$.

Now, $P(X \leq 74) = P\left(Z \leq \frac{74 - 65}{9}\right) = P(Z \leq 1) = 0.8413$ M1

Therefore student is ranked 84 th or 85 th. A1

Copyright © 1995 MAV