Start here for Question Number: 4

26 max

a) 1000, 1750, 2500

i) $a + (n-1)d$

$a = 1000 \quad n = 9 \quad d = 750$

$= 1000 + 750(9-1)$

$= 7000$ metres

$= 7$ km

ii) 10, 11, 12, 13

$10 = 1000 + (n-1)750$

$10 = 1000 + 750n - 750$

$10 = 250 + 750n$

$-240 = 750n$

-0.32

13th week $= 10\,000$

$= 10$ km

iii) $S_n = \frac{n}{2}(2a + (n-1)d)$

$= \frac{26}{2}(2(1000) + (26-1)750)$ 1/3

$= 13(20750)$

$= 269\,750$ m

$= 269.750$ km

b) $y = e^{2x}$

$y = \int_1^2 e^{2x}$

$= \frac{e^{2x}}{2}$

$= \left(\frac{e^{2(2)}}{2} - \frac{e^2}{2}\right)$

$= 23.60$

$y = e^{-x}$

$\int_1^2 e^{-x}$

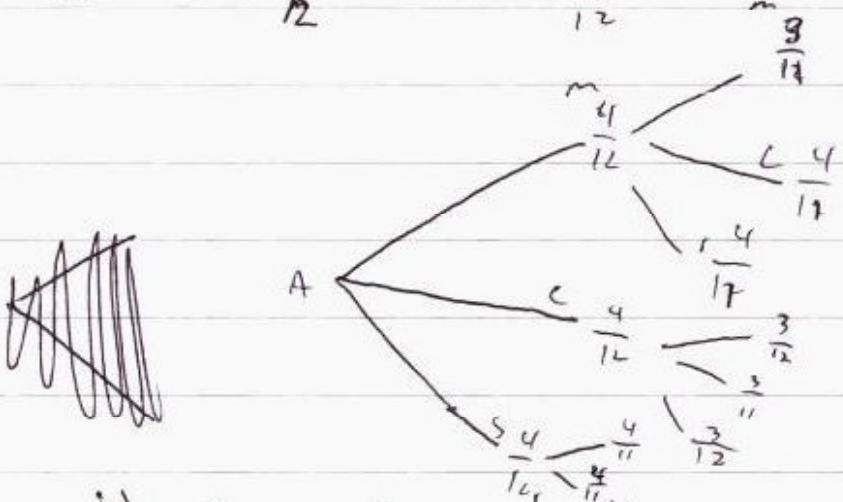
$= \left(\frac{e^{-x}}{-1}\right)_1^2$

$= 0.2325$

$\frac{4}{12} \times \frac{4}{11}$

$=$

c) $m = \frac{4}{12}$ $c = \frac{4}{12}$ $s = \frac{4}{12}$



$mm = \frac{1}{11}$

$cc = \frac{1}{11}$

$ss = \frac{1}{11}$

i) $\frac{4}{12} \times \frac{3}{11}$ ii) $\frac{3}{11}$

$= \frac{12}{132}$

$= \frac{1}{11} = 0.1$

iii) 0.6

$= 0.6$ $= 0.39$

$= 0.4$

Additional writing space on back page.

d) $f(x) = 1 + e^x$

$f(-x) = 1 + e^{-x}$

$f(x) + f(-x) = 1 + e^x + 1 + e^{-x}$

$= 2 + e^x + e^{-x}$

$(1 + e^x)(1 + e^{-x})$

$= 1 + e^{-x} + e^{-x^2} + e^x$

$= 0$

$f'(x) = e^x$

$f'(-x) = e^{-x}$

$e^x + e^{-x} = 0$

$e^x + e^{-x} = 0$

You may ask for an extra Writing Booklet if you need more space to answer question 4.