MAAA26 Assignment 4 – Spring 2007

Question 1

(a) (ii) $(1\,1\,0\,1\,0\,1\,0\,0\,0\,1\,0\,1\,1)_2 = (15213)_8$

1 5 2 1 3

(a)(iii) $(1\,1\,0\,1\,0\,1\,0\,0\,0\,1\,0\,1\,1)_2 = (1A8B)_{16}$

1 A 8 B

(a)(i) $(1\,1\,0\,1\,0\,1\,0\,0\,0\,1\,0\,1\,1)_2 = (1A8B)_{16}$

$= 11 + 8\cdot 16 + 10\cdot 16^2 + 1\cdot 16^3 = 6795$

(b)

$18723 \div 8 = 2340$ r 3
$2340 \div 8 = 292$ r 4
$292 \div 8 = 36$ r 4
$36 \div 8 = 4$ r 4
$4 \div 8 = 0$ r 4

so $18723 = (44443)_8$

$= (100\,100\,100\,100\,011)_2$

4 9 2 3

$= (4923)_{16}$

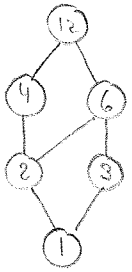
(c) $y = 8x$ (putting a 0 after a binary number means 'multiply by 2', so e.g. $(11)_2 = 3$ and $(11000)_2 = 3\cdot 2\cdot 2\cdot 2 = 3\cdot 8 = 24$)

Question 2

$10941 = 3\cdot 3647 = 3\cdot 7\cdot 521$ (521 is prime as it is not divisible 2, 3, 5, 7, 11, 13, 17, 19, 23)

$13243 = 17\cdot 779 = 17\cdot 19\cdot 41$ (41 is prime as it is $\leq 7^2$ and we have already checked for division by all primes up to 19)

Question 3



or