MATH221 – Mathematics for Computer Science – Autumn 2018

Assignment Two – due in Week Eleven tutorial

*Student Name:*_____ *Student Number:*_____

*Tutorial Day & Time:*_____

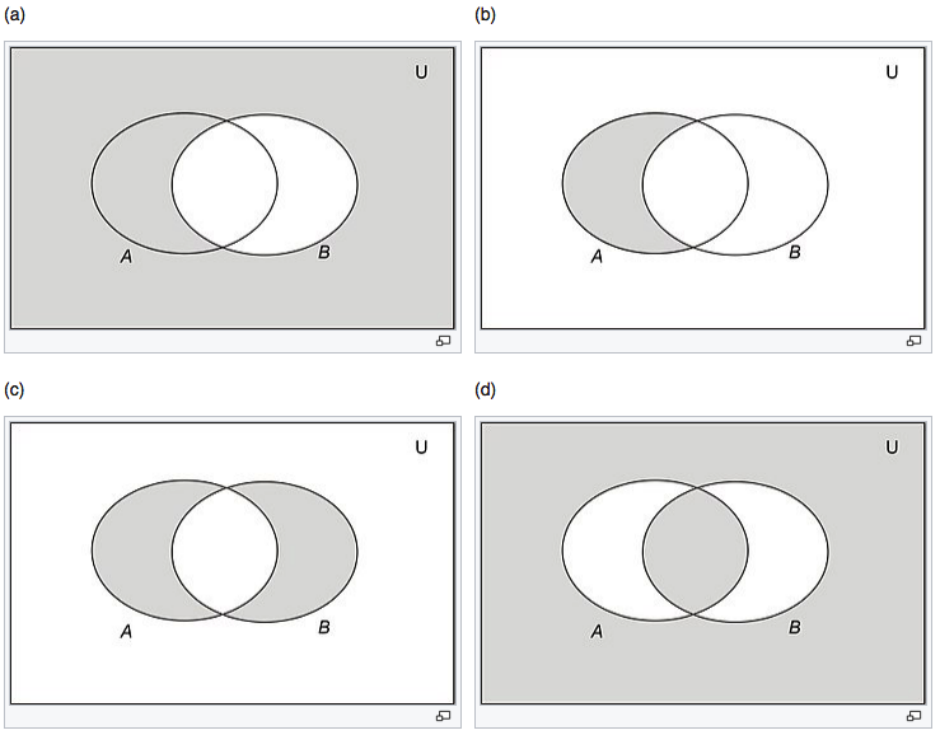
Untidy or badly set out work will not be marked, and will be recorded as unsatisfactory.

Question 1. [4 Marks]

(a) Find a natural number n such that $2 \cdot 1066 + 1492 \equiv n \pmod{1776}$. Is n unique?

(b) Show that there is no $n \in \mathbb{N}$ such that $n \equiv 3 \pmod{4}$ and $n \equiv 5 \pmod{8}$.

Question 2. [4 Marks] Identify the shaded regions, using only the union, intersection and complement symbols.



Question 3. [4 Marks] What is the coefficient of x^5 in the expression $(-4 + 3x)^{12}$? (Do NOT multiply $-4 + 3x$ by itself 12 times.)

Question 4. [8 Marks] Prove or disprove that the following are equivalence relations. If you find one (or both) that is an equivalence relation, write out $[-1]$ and $\left[\frac{4}{5}\right]$.

(a) For $a, b, c, d \in \mathbb{Z}$ with $b, d \neq 0$: $\frac{a}{b} R \frac{c}{d} \Leftrightarrow ad = bc$.

(b) For $x, y \in \mathbb{R}$: $R = \{(x, y) : |x - y| \leq 1\}$.

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Assignment One, Autumn 2017

Submission Receipt for Tutorial Submission

*Student Name:*_____ *Student Number:*_____

*Date Submitted:*_____ *Tutor Initials:*_____