

CSC465/2104 Test 0 2022 September 29, 4:10pm-5pm

1 page, 3 questions, 42 marks, 50 minutes
Aids allowed: one letter-sized page, both sides
and the laws from the textbook, 14 pages

The value of each question is indicated in square brackets.

A blank answer is worth about one-third of the marks;
to that, marks will be added for readable and relevant and correct information,
and marks will be subtracted for unreadable or irrelevant or incorrect information.

0[12] Let a and b be binary variables. Using the proof format and laws in the textbook,
prove

$$a=(a\Rightarrow b) = a\wedge(a\Rightarrow b)$$

1 Simplify (no proof)

(a)[3] $(1, 7-3) + 4 - (2, 6, 8)$

(b)[3] $nat+nat$

(c)[3] $nat-nat$

(d)[3] $nat\times nat$

(e)[3] $(nat+1)+(nat+1)$

2[15] Simplify (with proof)

$$\forall y: nat. y = x+2 \vee y = x+1 \Rightarrow y > 5$$