MAT347Y1 HW1 Marking Scheme

Friday, September 19

Total: 25 points.

1.1.20: 5 points.

- (2) Finite case: $x^n = 1$ implies $(x^{-1})^n = 1$ (note that this only proves $|x^{-1}| | n$)
- (2) Finite case: $|x^{-1}| = |x|$
- (1) When x has infinite order

1.1.25: 3 points.

1.2.5: 5 points.

- (2) Case r^i $(1 \le i < n)$
- (2) Case $sr^i \ (0 \le i < n)$
- (1) Proof that $r^i \neq r^{-i}$, or equivalently, $r^{2i} \neq 1$, for $1 \leq i < n$ (this fact does need proof! Note that in D_{12} , $r^3 = r^{-3}$). If you use this fact without proof in either of the two cases but the rest of the proof is correct, you still get the full 2 points for that case.

1.4.2: 4 points.

- (1) Correct list of elements
- (1) Identity is order 1
- (1) Three elements of order 2
- (1) Two elements of order 3

Handout problem 1: 8 points.

- (1 each) For each of the seven cycle types, correctly compute the order and number of elements
- (1) Compile results by n (yes, I know this is picky if you've done all the cycle type computations correctly, but you have to answer the question as it's stated)