MAT347Y1 HW9 Marking Scheme

Friday, January 9

Total: 24 points (Maximum 27).

7.1.24: 5 points.

- (4) Providing a valid unit for each case
- (1) Reasoning for why these have infinite order (note: though this can be done by induction on the coefficients, the easiest way is using the absolute value on \mathbb{R})

7.3.21: 8 points. Letting J be the set of entries of elements in I,

- (1) $I \subseteq M_n(J)$
- (2) Any matrix with a single non-zero coefficient in J is in I (uses the hint)
- (2) $M_n(J) \subseteq I$
- (3) J is a two-sided ideal (for all $x, y \in J$ and $a \in R$, prove $ax, xa, x y \in J$)

7.3.34: 10 points.

- (a) 3 points: (2) I + J is an ideal, (1) the smallest.
- (b) 3 points: (2) IJ is an ideal, (1) contained in $I \cap J$
- (c) 1 point.
- (d) 3 points.

Handout #2: 1 point.

- (a) 2 bonus points
- (b) 1 point
- (c) 1 bonus point