2020W A33 Quiz 1 T22 Rubric

[Q1a]
1 mark * 3 - each correct inequality direction
1 mark * 3 - each correct line
1 mark - indication it is unbounded via graph
(-0.5 total if any line not labelled)
(-0.5 total if any corner pt not labelled)
(-0.5 total if feasible region 'R' not shown)

[Q1b]
3 marks - for everyone 3/3. There was a mistake, the value should have been -25 instead of 25

[Q1c]
3 marks - demonstrate the relationship between increasing x and y values vs. the result of Z
2 part marks - if explained using opposite logic (increasing instead of decreasing)
2 part marks - mentioned unboundedness, by LP theorem only max or min can exist, not both. However, did not show any relationship for Z increasing and decreasing.

[Q2a]
1 mark - objective function
2 marks - teaching, admin constraints on A32, A33
2 mark - minimum 30 students constraints on A32, A33
1 mark - process of determining corner points
1 mark - process of determining revenue
1 mark - correct answer(0.5 if calculation error)

[Q2b]
2 marks - determine new constraint is x >= 40
2 mark - correct corner points(0.5 if calculation error)

[Q3]
4 marks - by the LP theorem, it is bounded and non empty. So it is guaranteed to have a minimum value, no matter the objective function. (1,1) is in the feasible region as a corner point, so it is possible that its a min.
1 mark - a suitable choice of a,b. Eg. Z = 10x - y. Z = ax - by has a behaviour of moving towards the origin as z decreases. From a graphical perspective, since we want to hit the point (1,1) last, we want the objective function to be as straight as possible to the y axis. Other examples like Z = x - y (parallel with constraint) also work, many other options
OR
2 marks - lines that intersect (1,1)
1 mark - suitable choice of a,b
2 marks - compare the value of (1,1) to other corner points such that (1,1) is indeed the smallest value