

MA30041: Metric Spaces

SELF-ASSESSMENT SHEET 4: OPEN & CLOSED SETS

- 1.) Let U, V be subsets of a metric space (X, d) . Show: If $U \subset V$, then $\text{int } U \subset \text{int } V$.
For a solution, click on the the following space:

- 2.) Let U, V be subsets of a metric space (X, d) . Show: If $\text{int}(U \subset V) = \text{int } U \cap \text{int } V$.
For a solution, click on the the following spaces:

“ \subset ”:

“ \supset ”:

- 3.) Let U, V be subsets of a metric space (X, d) .

(i) Show: $\text{int } U \cup \text{int } V \subset \text{int}(U \cup V)$.

For a solution, click on the the following space:

- (ii) Show that in general equality does not hold in the previous (set-) equation.
For a solution, click on the the following space:

Please turn over!

- 4.) Let U, V be subsets of a metric space (X, d) . Show: If $U \subset V$, then $U' \subset V'$.
For a solution, click on the the following space:
(note, we are using the notation $A_1 - A_2$ for $A_1 \setminus A_2$ here)
-

- 5.) Let U, V be subsets of a metric space (X, d) .

- (i) Show: $(U \cap V)' \subset U' \cap V'$.

For a solution, click on the the following space:

(note, we are using the notation $A_1 - A_2$ for $A_1 \setminus A_2$ here)

- (ii) Show that in general equality does not hold in the previous (set-) equation.

For a solution, click on the the following space:
