

MATH48181/68181: EXTREME VALUES AND FINANCIAL RISK  
SEMESTER 1

QUIZ PROBLEM 9

(Deadline: 11:00am on Wednesday, 15 December 2021)

Suppose  $C_1, C_2, \dots, C_p$  are known copulas. Show that the following is a copula

$$C(u_1, u_2) = \left\{ \alpha_1 [C_1(u_1, u_2)]^\beta + \dots + \alpha_p [C_p(u_1, u_2)]^\beta \right\}^{1/\beta}$$

where  $\beta > 0$  and  $\alpha_1, \alpha_2, \dots, \alpha_p$  are non-negative real numbers summing to 1. Please give full details.

**This problem is worth 1 mark. Marking scheme: 1 mark if the answer is correct, and the derivation is correct and detailed enough; 0.5 mark if the answer is correct, and the derivation is incorrect or not detailed enough; 0.5 mark if the answer is incorrect or not given, but the derivation is correct and detailed enough; 0 mark if the answer is correct, but the derivation is not detailed enough; 0 mark if the answer is incorrect, and the derivation is not detailed enough.**

Please use Blackboard to submit your answer.