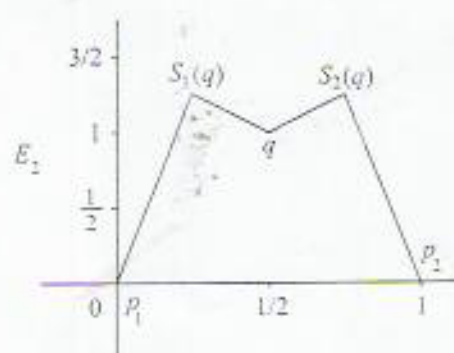


and

$$S_2(q) = S_2(1/2, 1) = (1/4 + 1/2, -1/2 + 3/4 + 1) = (3/4, 5/4).$$

We are now in a position to sketch E_2 .



6 marks

(c) It follows from Example 11.4 that we must choose c_1 and c_2 such that

$$1 + \frac{\log(c_1 + c_2)}{\log 2} = 1.85,$$

that is,

$$c_1 + c_2 = \exp(0.85 \log 2) = 1.80$$

to 2 decimal places.

For (11.9) to be satisfied, we must also have

$$1/2 < c_i \leq 1, \text{ for } i = 1, 2.$$

Both of the above conditions are satisfied if, for example, we take $c_1 = c_2 = 0.9$.

For (11.10) to be satisfied and E_1 to remain unchanged, we must also have

$$S_1(p_2) = S_2(p_1) = (1/2, 1)$$

where

$$p_1 = \left(0, \frac{b_1}{1 - c_1}\right) = (0, 0) \text{ and } p_2 = \left(1, \frac{a_2 + b_2}{1 - c_2}\right) = (1, 0).$$

These conditions do not depend on the values of c_1 and c_2 and so we can leave the values of $a_i, b_i, 1 \leq i \leq 2$, unchanged.

6 marks

[25 marks]