Suppose you flip a fair coin three times and X is the number of Heads you get divided by the sum of the numbers of Heads and Tails you get. What is the expected value of X ?

(a) 1/2

(b) 5/6

(c) 3/2

(d) 1/3

(e) 1/6

(f) 2/3

(g) 0

(h) 1

(i) 2

(j) 3

(k) None of these

Solution: Solution:
$E[X] = \left(\frac{0}{3} \cdot \frac{1}{8}\right) + \left(\frac{1}{3} \cdot \frac{3}{8}\right) + \left(\frac{2}{3} \cdot \frac{3}{8}\right) + \left(\frac{3}{3} \cdot \frac{1}{8}\right) = \frac{3+6+3}{24} = \frac{1}{2}$.