You flip a biased coin (with $P(Heads) = 2/5$) twice and roll a fair die once. Let X be the total number of Heads coming up on the two coin flips, and let Y be the number that appears on the die. What is the probability that X is larger than Y ?

(a) 2/75

(b) 4/25

(c) 1/15

(d) 21/25

(e) 3/5

(f) 1

(g) 0

(h) 1/6

(i) 1/24

(j) None of these

You flip a biased coin (with $P(Heads) = 1/3$) twice and roll a fair die once. Let X be the total number of Heads coming up on the two coin flips, and let Y be the number that appears on the die. What is the probability that X is larger than Y ?

(a) 1/54

(b) 1/9

(c) 1/18

(d) 8/9

(e) 2/3

(f) 1

(g) 0

(h) 1/6

(i) 1/24

(j) None of these

You flip a biased coin (with $P(Heads) = 2/3$) twice and roll a fair die once. Let X be the total number of Heads coming up on the two coin flips, and let Y be the number that appears on the die. What is the probability that X is larger than Y ?

(a) 2/27

(b) 4/9

(c) 1/9

(d) 5/9

(e) 1/3

(f) 1

(g) 0

(h) 1/6

(i) 1/24

(j) None of these

You flip a biased coin (with $P(Heads) = 1/5$) twice and roll a fair die once. Let X be the total number of Heads coming up on the two coin flips, and let Y be the number that appears on the die. What is the probability that X is larger than Y ?

(a) 1/150

(b) 1/25

(c) 1/30

(d) 24/25

(e) 4/5

(f) 1

(g) 0

(h) 1/6

(i) 1/24

(j) None of these

Solution: Let $q = k/n$. Then, $P(X > Y) = P(X = 2, Y = 1) = P(X = 2)P(Y = 1) = q^2(1/6) = k^2/6n^2$.