

Keiko tosses one penny and Ephraim tosses two pennies. The probability that Ephraim gets the same number of heads that Keiko gets is

- (A) $\frac{1}{4}$ (B) $\frac{3}{8}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$ (E) $\frac{3}{4}$

2000 AMC 8, Problem #21—
“Make a complete list of equally likely outcomes.”

Solution

Answer (B): Make a complete list of equally likely outcomes:

Keiko	Ephraim	Same Number of Heads?
H	HH	No
H	HT	Yes
H	TH	Yes
H	TT	No
T	HH	No
T	HT	No
T	TH	No
T	TT	Yes

The probability that they have the same number of heads is $\frac{3}{8}$.

Difficulty: Hard

NCTM Standard: Data Analysis and Probability Standard for Grades 68: compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.

Mathworld.com Classification: Probability and Statistics > Probability