Trees/Combined Events

Mana Maths

Te reo Māori terms

tūponotanga
probability
Open in Te Aka

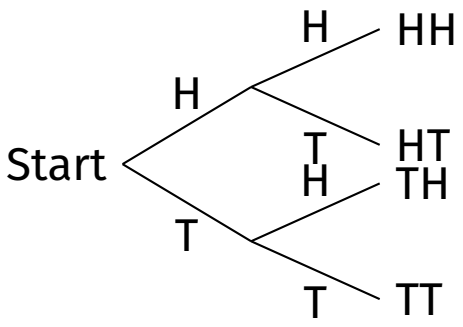
rākau
tree
Open in Te Aka

peka
branch
Open in Te Aka

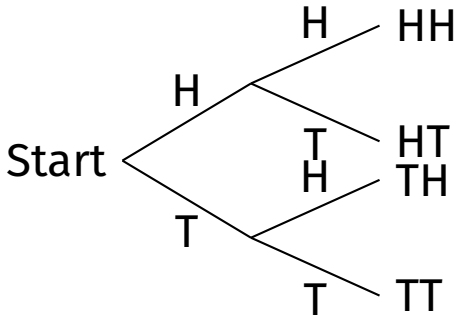
putanga
outcome
Open in Te Aka

Foundation

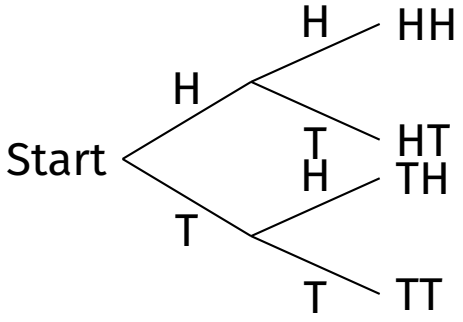
1. Use this tree to list the possible outcomes for two fair coin tosses.



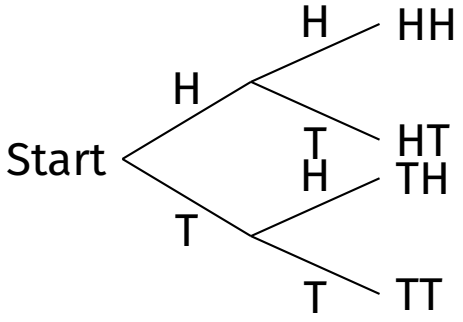
2. Use the tree to say how many outcomes are possible when two fair coins are tossed.



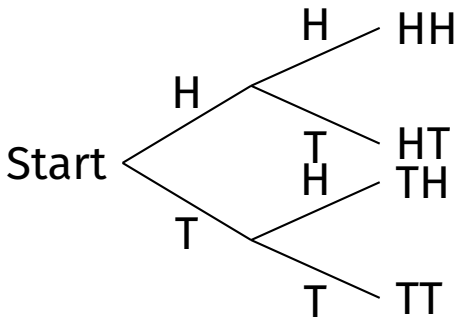
3. Use the tree to write the probability of getting HH.



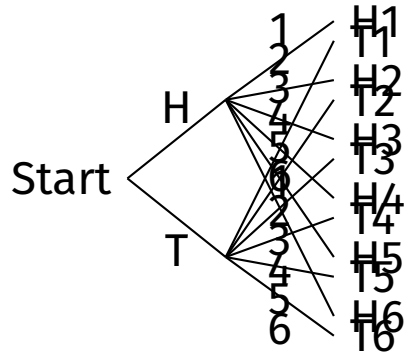
4. Use the tree to write the probability of getting TT.



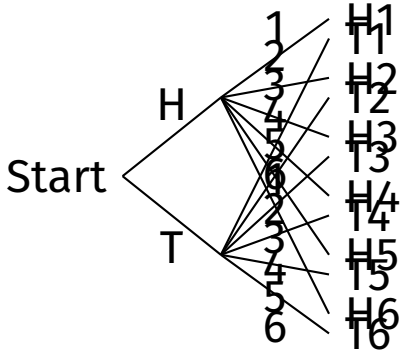
5. Use the tree to write the probability of getting exactly one head.



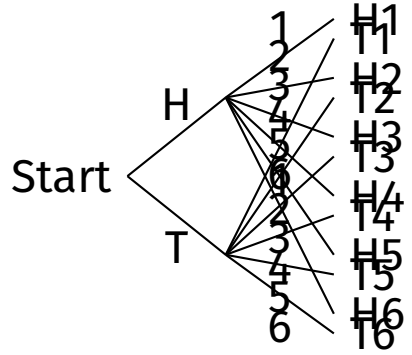
6. Use this tree for a coin toss and a fair die roll. How many outcomes are possible altogether?



7. Use the tree to find the probability of getting H and 3.



8. Use the tree to find the probability of getting T and an even number.



9. Fill in the blank using the coin tree: the probability of at least one tail is $\frac{\square}{4}$.

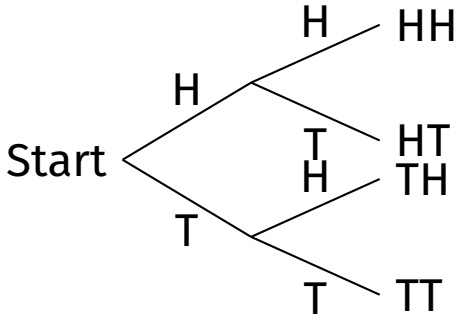
10. Fill in the blank using the coin-and-die tree: the probability of heads is $\frac{\square}{12}$.

11. Which is more likely when two fair coins are tossed: two heads or exactly one head?

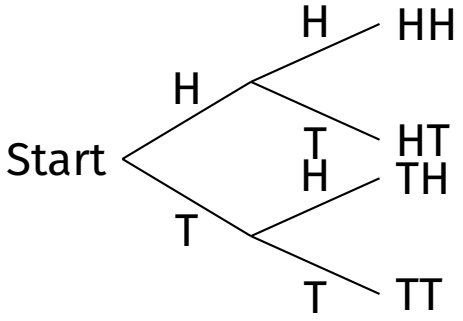
12. A student says there are only three outcomes when two coins are tossed: heads, tails, and one of each. Are they correct?

Proficient

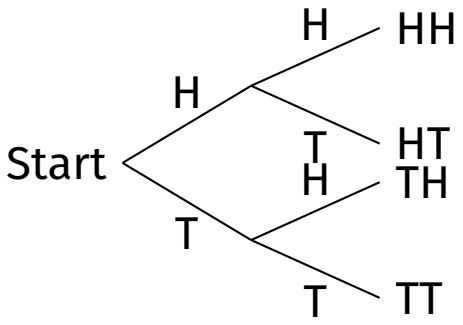
1. Use this tree to list the full sample space for two fair coin tosses.



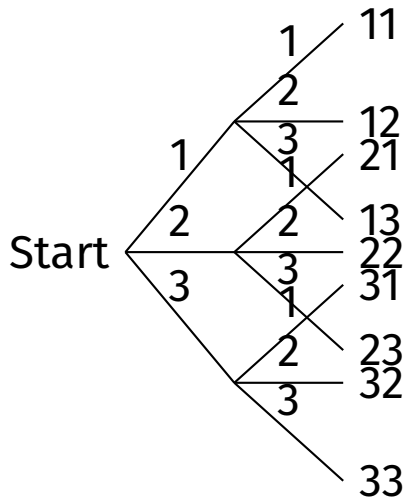
2. Use the tree to find the probability of getting exactly two heads.



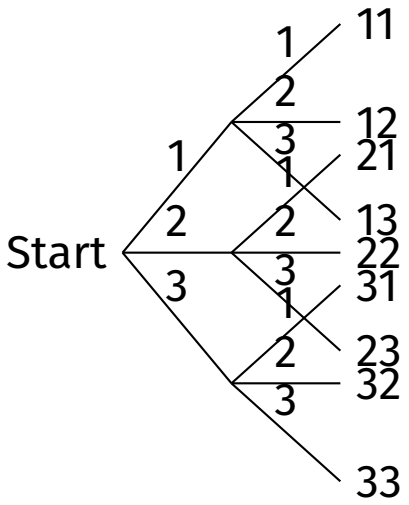
3. Use the tree to find the probability of getting at least one head.



4. Use this tree for a spinner labelled $1, 2, 3$ spun twice. List the outcomes where the total is 4.



5. Use the tree to find the probability that the total is 4.



6. A fair die is rolled twice. What is the probability of getting a 6 then an even number?

7. A fair die is rolled twice. What is the probability that both numbers are odd?

8. A bag has 2 red and 1 blue counter. A counter is picked, replaced, then picked again. What is the probability of red then blue?

9. A bag has 2 red and 1 blue counter. A counter is picked, replaced, then picked again. What is the probability of two blues?

10. A fair coin is tossed twice. What is the probability of getting the same result both times?

11. A fair coin is tossed twice. What is the probability of getting different results?

12. Fill in the blank: for two fair coin tosses, the probability of exactly one head is $\frac{\square}{4}$.

13. Fill in the blank: for two fair die rolls, the probability of getting two odd numbers is $\frac{\square}{36}$.

14. Which is greater: the probability of two heads in two coin tosses or the probability of a 6 then a 6 in two die rolls?

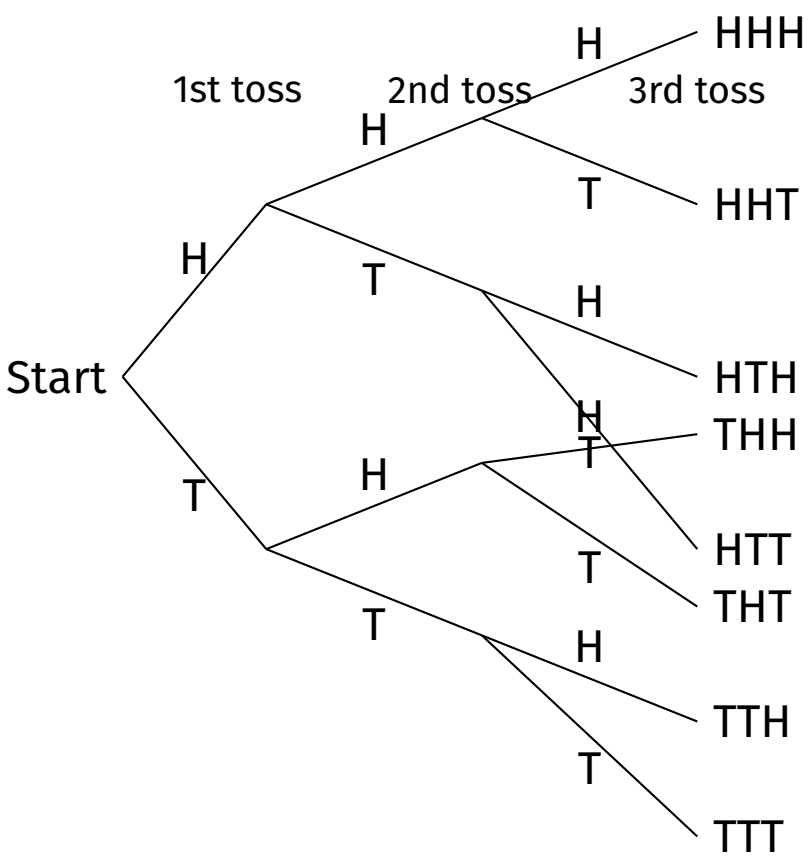
15. Which is smaller: the probability of red then blue from a red-blue spinner spun twice or the probability of two reds?

16. A student says the probability of H then 5 when a coin is tossed and a die is rolled is $\frac{1}{6}$. Are they correct?

17. Explain in one short sentence what a branch on a tree diagram shows.

Excellence

1. Use this tree for Questions 1–4.



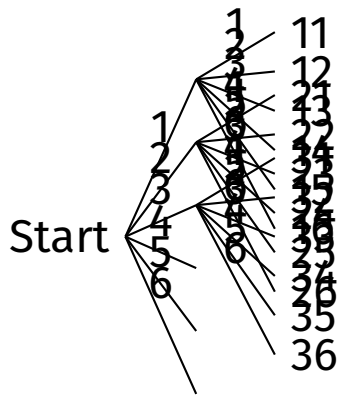
2. Is the probability of at least one head equal to $\frac{1}{2}$? Explain.

3. Use the tree to find the probability of getting exactly two heads.

4. Use the tree to find the probability of getting at least one tail.

5. A student says HTH and THH are the same because both have two heads and one tail. Are they correct? Explain using tree paths.

6. Use this partial two-dice tree to help find the probability that the total is 7.



7. Use the tree to find the probability that both numbers are greater than 4.

8. A spinner has equal sectors labelled A, B, and C. It is spun twice. What is the probability of getting exactly one A?

9. A spinner has equal sectors labelled 1, 2, 3, and 4. It is spun twice. What is the probability that both spins are even?

10. A bag has 3 red and 2 blue counters. A counter is picked, replaced, then picked again. What is the probability of getting one red and one blue in any order?

11. A bag has 3 red and 2 blue counters. A counter is picked, replaced, then picked again. What is the probability of getting two counters of the same colour?

12. Which is greater: the probability of exactly one head in three coin tosses or the probability of a total of 7 in two die rolls? Show enough working to justify.

13. Which is smaller: the probability of two blues from a bag with 3 red and 2 blue counters, with replacement, or the probability of two heads in two coin tosses? Explain.

14. Fill in the blank: when a fair coin is tossed three times, the probability of HHH is $\frac{\square}{8}$.

15. Fill in the blank: when a fair die is rolled twice, the probability of getting doubles is $\frac{\square}{36}$.

16. Which does not belong: outcome, branch, sample space, perimeter? Explain.

17. Explain why a full tree diagram helps avoid missing combined outcomes.