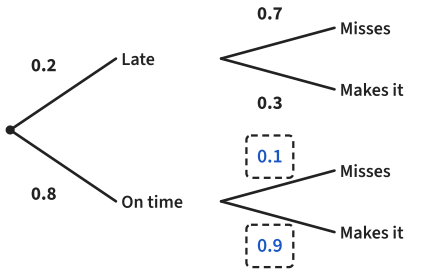
Conditional Probability: Tree Diagrams

ANSWERS

1

Nia's bus is late with probability 0.2. If it is late, she misses registration with probability 0.7. If not, 0.1. Complete the tree.
Find (a) P(misses) (b) P(late, given she misses).



0.2 × 0.7 + 0.8 × 0.1 = 0.22

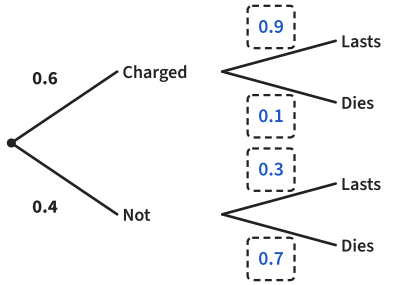
add the routes

0.14 ÷ 0.22 = 0.14/0.22 = 7/11

given that: divide

2

Kai charges his phone overnight with probability 0.6. If he does, it lasts the day with probability 0.9. If not, 0.3. Complete the tree.
Find (a) P(lasts) (b) P(charged, given it lasts).



0.6 × 0.9 + 0.4 × 0.3 = 0.66

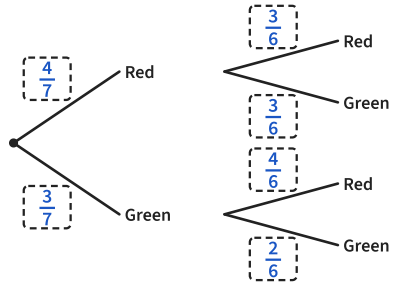
add the routes

0.54 ÷ 0.66 = 0.54/0.66 = 9/11

given that: divide

3

A bag has 4 red and 3 green counters.
Two are taken without replacement.
Complete the tree. Given that the second counter is green, find P(the first was red).



4/7 × 3/6 + 3/7 × 2/6 = 18/42

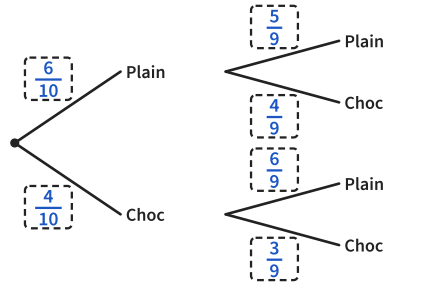
add the routes

12/42 ÷ 18/42 = 12/18 = 2/3

given that: divide

4

A tin has 6 plain and 4 chocolate biscuits.
Ravi eats two at random. Complete the tree.
Given that they are the same type, find P(both chocolate).



6/10 × 5/9 + 4/10 × 3/9 = 42/90

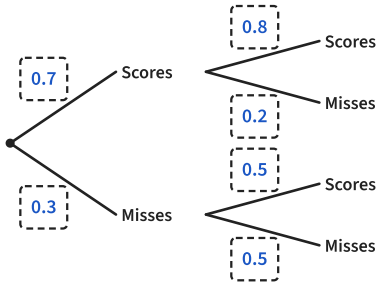
add the routes

12/90 ÷ 42/90 = 12/42 = 2/7

given that: divide

5

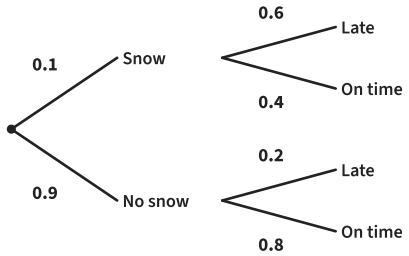
Ola takes two penalties. The probability that she scores the first is 0.7. If she scores, the probability that she scores the second is 0.8. If she misses, it is 0.5. Given that she scores exactly one, find P(she scored the first).



Answer 0.14/0.29 = 14/29

6

The tree shows snow and a train being late.
Find (a) P(late, given that it snows)
(b) P(snow, given that the train is late).

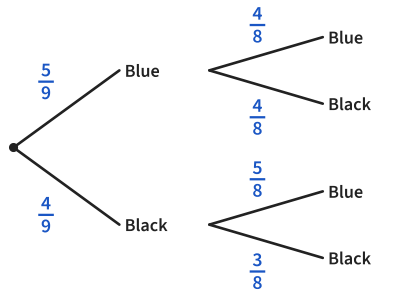


(a) 0.6

(b) 0.06/0.24 = 1/4

7

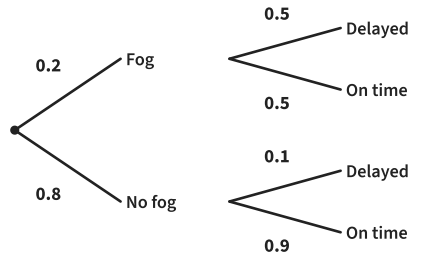
A box holds 5 blue and 4 black pens.
Two are taken at random,
without replacement. Draw a tree diagram.
Given that both pens are the same colour, find P(both black).



Answer 12/32 = 3/8

8

Mo is asked for P(fog, given that the flight is delayed). He writes 0.2 × 0.5 = 0.1.
Explain Mo's mistake. Then find the right answer.



0.1 is fog and delayed: divide by P(delayed)

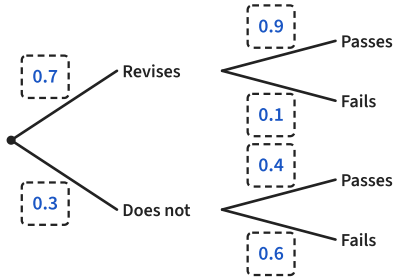
Answer 0.1/0.18 = 5/9

Conditional Probability: Tree Diagrams *further practice*

ANSWERS

9

The probability that Dev revises for a test is 0.7. If he revises, the probability that he passes is 0.9. If not, it is 0.4. Given that Dev passes, find the probability that he revised.

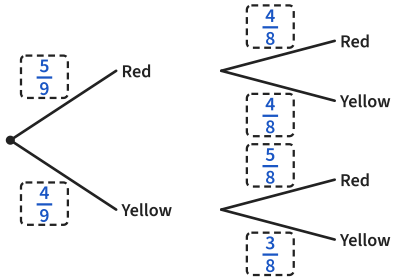


$P(\text{passes}) = 0.63 + 0.12 = 0.75$

Answer $\frac{0.63}{0.75} = \frac{21}{25}$

10

A bag has 5 red and 4 yellow sweets. Leah eats two at random. Given that the second sweet is yellow, find the probability that the first was red.

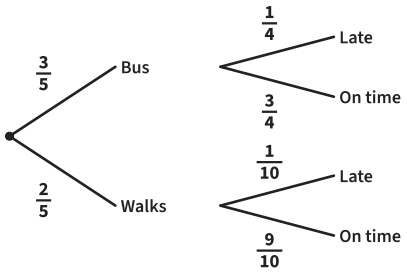


$\frac{20}{72} + \frac{12}{72} = \frac{32}{72}$

Answer $\frac{20}{32} = \frac{5}{8}$

11

The tree shows how Mia gets to school, and whether she is late. Given that Mia is late, find the probability that she took the bus.

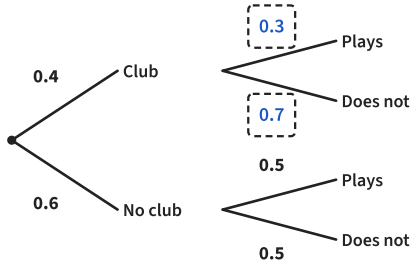


$\frac{3}{20} + \frac{1}{25} = \frac{15}{100} + \frac{4}{100} = \frac{19}{100}$

Answer $\frac{15}{100} \div \frac{19}{100} = \frac{15}{19}$

12

The probability that a student is in the music club is 0.4. The probability that a student is in the club and plays an instrument is 0.12. Complete the tree.

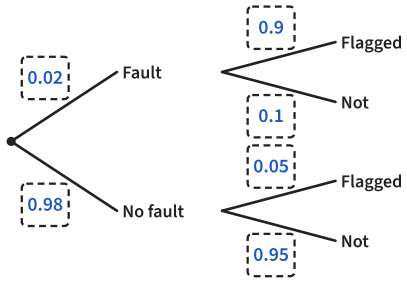


$0.4 \times ? = 0.12$, so $0.12 \div 0.4$

Answer 0.3 and 0.7

13

0.02 of phones have a fault. A test flags 0.9 of faulty phones, and wrongly flags 0.05 of phones with no fault. A phone is flagged. Is it more likely to have a fault or not? Show how you know.

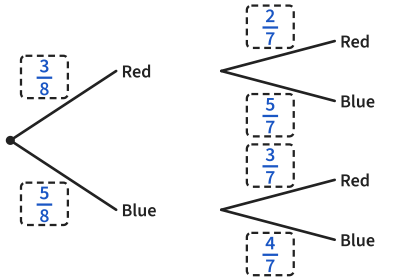


$P(\text{flagged}) = 0.018 + 0.049 = 0.067$

Answer $\frac{0.018}{0.067} = \frac{18}{67}$, so no fault

14

A bag has 3 red and 5 blue counters. Two are taken without replacement. Given that at least one is red, find P(both red).

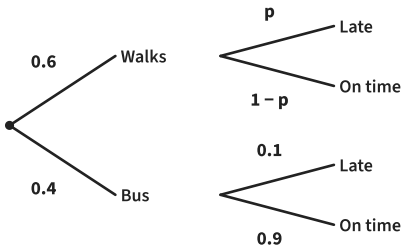


$1 - \frac{20}{56} = \frac{36}{56}$

Answer $\frac{6}{36} = \frac{1}{6}$

15

Jo walks to school with probability 0.6, or takes the bus. If she walks, the probability that she is late is p. By bus, it is 0.1. Given that Jo is late, the probability that she walked is $\frac{3}{4}$. Find p.

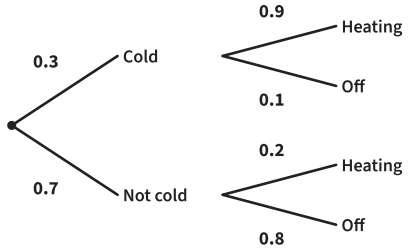


$\frac{0.6p}{0.6p + 0.04} = \frac{3}{4}$

Answer $p = 0.2$

16

Ade says P(heating on, given that it is cold) is the same as P(cold, given that the heating is on). Is Ade right? Explain.



$P(\text{heating}) = 0.27 + 0.14 = 0.41$

Answer No: 0.9 and $\frac{0.27}{0.41} = \frac{27}{41}$