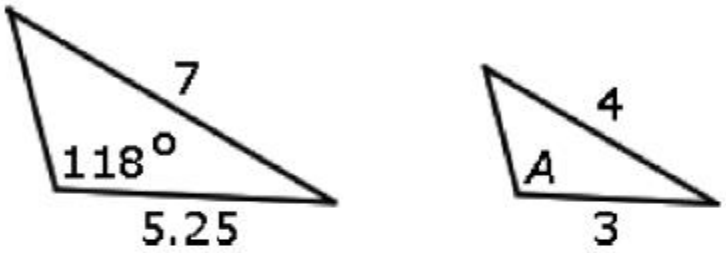
Week 7 Tuesday Course 3 Warm-up

These two triangles are similar. Which is the measurement for angle *A*?



A) 62°

B) 67°

C) 118°

D) 150°

Paradise Education Center
Soaring Above The Rest!

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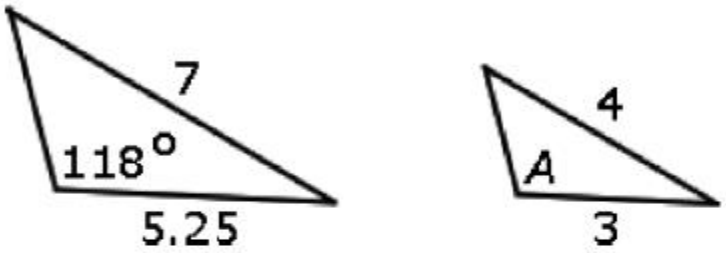

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Lesson 11.2 Probability of Compound Events

Objective

TSW understand concept of probability *use possibility diagrams to find probability of compound events

Common Core State Standards

Extend 7 SP 8b- Represent sample spaces for compound events suing methods such as organized lists, tables and tree diagrams.

Extend 7 SP 8a- Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

Mathematical Practices *MP3 Construct arguments MP 4 Model Mathematics MP8 Express regularity in reasoning*

Lesson 11.2 Probability of Compound Events

11.2 Probability of Compound Events Day 1

TSW understand concept of probability *use possibility diagrams to find probability of compound events
Vocabulary- How to find Probability of Compound Event

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11.2 Probability of Compound Events Day 1

TSW understand concept of probability *use possibility diagrams to find probability of compound events
Vocabulary- How to find Probability of Compound Event $$P(E) = \frac{\text{Number of outcomes favorable to event } E}{\text{Total number of equally likely outcomes}}$$

Find the probability of landing heads, then tails when tossing a coin twice. Be sure to use a probability tree diagram.

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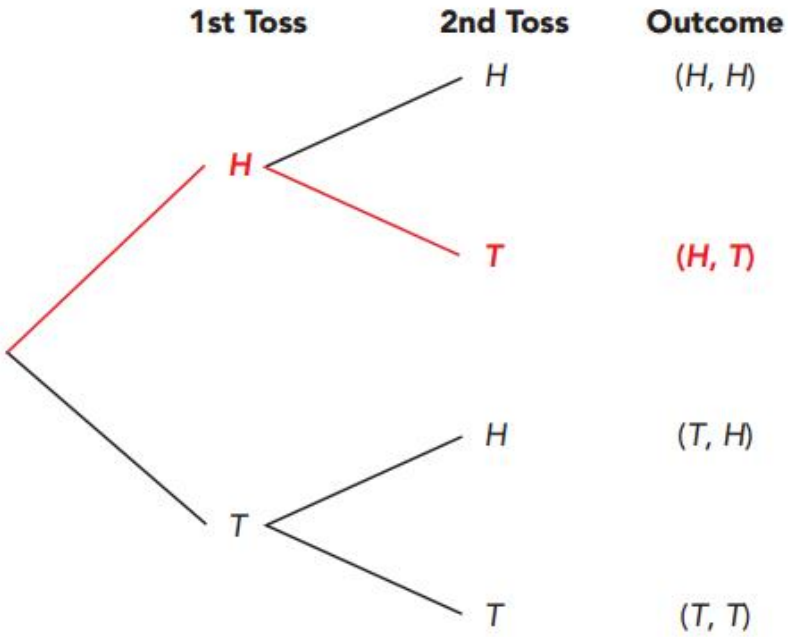


H represents heads
T represents tails

You can see that there are four possible outcomes: (*H*, *H*), (*H*, *T*), (*T*, *H*), and (*T*, *T*). However, there is only one favorable outcome, (*H*, *T*).

So, $P(H, T) = \frac{1}{4}$

You want to find the probability of landing heads then tails, so the order of events is important. P(*H*, *T*) is not the same as P(*T*, *H*) here.

Example 4 Use a possibility diagram to find the probability of a compound event.

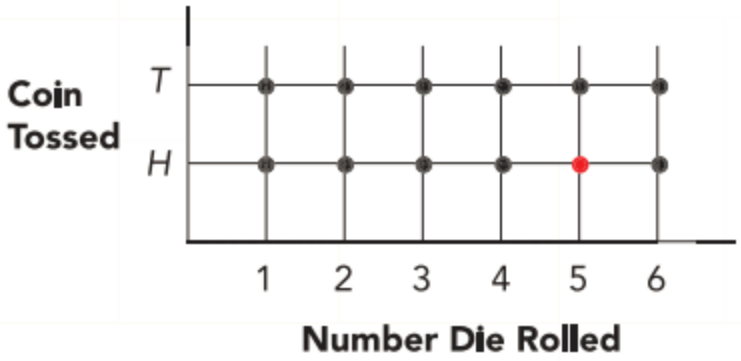
Use a possibility diagram to find each probability.

a) A fair coin and a fair six-sided number die are tossed together. Find the probability of showing heads and a 5.

Method 1

Solution

Method 1



H represents heads
T represents tails

$$P(H, 5) = \frac{1}{12}$$

Example 4 **Use a possibility diagram to find the probability of a compound event.**

Use a possibility diagram to find each probability.

a) A fair coin and a fair six-sided number die are tossed together. Find the probability of showing heads and a 5.

Method 2

Method 2

Number Die

Coin	1	2	3	4	5	6
H	(1, *H*)	(2, *H*)	(3, *H*)	(4, *H*)	(5, *H*)	(6, *H*)
T	(1, *T*)	(2, *T*)	(3, *T*)	(4, *T*)	(5, *T*)	(6, *T*)

H represents heads
T represents tails

$$P(H, 5) = P(5, H) = \frac{1}{12}$$

b) Two fair six-sided number dice are rolled. Find the probability that the sum of the two numbers rolled is a prime number.

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Solution

2nd Number Die \ 1st Number Die	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Math Note

Recall that a prime number is a whole number greater than 1 that is divisible by only 1 and itself.

The prime numbers in the possibility diagram are 2, 3, 5, 7, and 11. There are 15 prime numbers out of 36 equally likely possible outcomes.

c) Two fair four-sided number dice, one red (R) and one blue (B), are rolled, and the number on the bottom is recorded. The red number die has numbers 1, 2, 4, and 7. The blue number die has numbers 2, 5, 8, and 9. Find the probability that the number recorded from the blue number die is more than 3 greater than the number recorded from the red number die. That is, find $P(B - R > 3)$.

c) Two fair four-sided number dice, one red (R) and one blue (B), are rolled, and the number on the bottom is recorded. The red number die has numbers 1, 2, 4, and 7. The blue number die has numbers 2, 5, 8, and 9. Find the probability that the number recorded from the blue number die is more than 3 greater than the number recorded from the red number die. That is, find $P(B - R > 3)$.

Solution

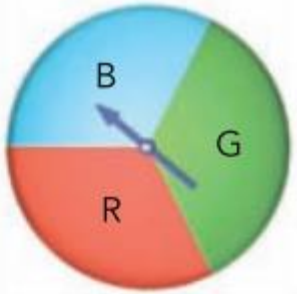
Method 1

Blue Number Die \ Red Number Die	1	2	4	7
2	(1, 2)	(2, 2)	(4, 2)	(7, 2)
5	(1, 5)	(2, 5)	(4, 5)	(7, 5)
8	(1, 8)	(2, 8)	(4, 8)	(7, 8)
9	(1, 9)	(2, 9)	(4, 9)	(7, 9)

$$P(B - R > 3) = \frac{7}{16}$$

d) The two spinners shown are spun. Find the probability that the pointers stop at 1 on Spinner 1 and blue (*B*) on Spinner 2.

Spinner 1



Spinner 2

Lesson 11.2 Probability of Compound Events

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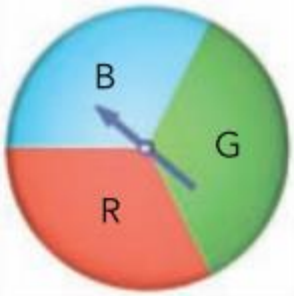
Spinner 1



Spinner 2

Solution

Spinner 2 \ Spinner 1	1	1	2	4
B	(1, *B*)	(1, *B*)	(2, *B*)	(4, *B*)
G	(1, *G*)	(1, *G*)	(2, *G*)	(4, *G*)
R	(1, *R*)	(1, *R*)	(2, *R*)	(4, *R*)

$$P(1, B) = \frac{2}{12} = \frac{1}{6}$$

Guided Practice

Solve. Show your work.

4 Three fair coins are tossed together.

a) Draw a tree diagram to represent all possible outcomes.

b) Using your answer in a), find the probability of getting all heads.

c) Using your answer in a), find the probability of getting at least two tails.

Lesson 11.2 Probability of Compound Events

1. Two fair four-sided number dice, each numbered 1 to 4, are rolled together. The result recorded is the number facing down. Find the probability that the product of the two numbers is divisible by 2. $\frac{3}{4}$

2. One colored disc is randomly drawn from each of two bags. Each bag has 5 colored discs: 1 red, 1 green, 1 blue, 1 yellow, and 1 white. Find the probability of drawing a blue or yellow disc. $\frac{16}{25}$

3. A box has 1 black, 1 green, 1 red, and 1 yellow marble. Another box has 1 white, 1 green, and 1 red marble. A marble is taken at random from each box. Find the probability that a red marble is not drawn. $\frac{1}{2}$

Lesson 11.2 Probability of Compound Events

Practice 11.2 #1-14

Practice 11.2

Solve. Show your work.

1. A bag contains 2 blue balls and 1 red ball. Winnie randomly draws a ball from the bag and replaces it before she draws a second ball. Use a possibility diagram to find the probability that the balls drawn are different colors.

2. A letter is randomly chosen from the word FOOD, followed by randomly choosing a letter from the word DOG. Draw a tree diagram to find the probability that both letters chosen are the same.

3. Three pebbles are placed in a bag: 1 blue, 1 green, and 1 yellow. First a pebble is randomly drawn from the bag. Then a fair four-sided number die labeled 1 to 4 is rolled. The result recorded is the number facing down. Use a possibility diagram to find the probability of drawing a yellow pebble and getting a 4.

4. Thomas rolled two number dice: a fair six-sided one and a fair four-sided one labeled 1 to 4. Use a possibility diagram to find the probability of rolling the number 3 on both dice.

Challenge-

*Solve created equations

"Challenge your brain"

*BuzzMath

*MangaHigh

Lesson Check #9 & 11- can use a possibility diagram to represent and find the number of possible outcomes for a compound event

Probability of Compound Events

Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented CONNECTED to what you already knew?

2. What new ideas did you get that EXTENDED or pushed your thinking in new directions?

3. What is still CHALLENGING or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?