What Did The Girl Rock Say To The Boy Rock?

Find the answer to any question below in the code key. Notice the letter next to it. Print this letter in the box at the bottom of the page that contains the problem number. Keep working and you will discover the answer to the title question.

① If a coin is tossed, what is the probability of getting a head?

② If a coin is tossed, what is the probability of getting a tail?

③ Suppose a coin is tossed 100 times. About how many times would you expect to get heads?

Suppose you roll a regular 6-faced die. What is the probability of rolling:

④ a 6? ⑤ a 2? ⑥ a 4?

⑦ Suppose you roll a 6-faced die 90 times. About how many times would you expect to get a 5?

Suppose a jar contains 5 red marbles, 4 white marbles, and 3 blue marbles. If a marble is drawn at random from the jar, what is the probability that it is:

⑧ red? ⑨ white? ⑩ blue?

A spinner is pictured at the right. If the arrow is spun, what is the probability that the spinner lands on:

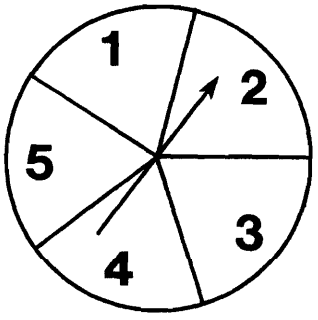
⑪ 2?

⑫ 3?

⑬ 5?

⑭ an even number?

⑮ a number less than 3?



⑯ Suppose the arrow is spun 50 times. About how many times would you expect the spinner to land on an odd number?

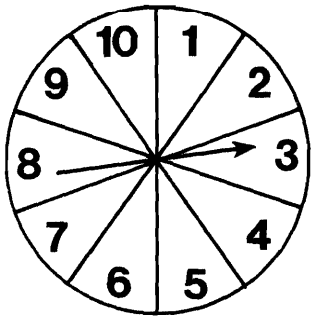
CODE KEY	
$\frac{5}{12}$	R
$\frac{1}{2}$	T
30	D
$\frac{1}{4}$	I
50	O
$\frac{2}{5}$	B
15	A
$\frac{1}{3}$	U
$\frac{1}{6}$	E
$\frac{1}{5}$	L

14	5	7	13	10	2	1	11	4	15	3	9	12	16	6	8

What Is Long And Yellow And Never Rings?

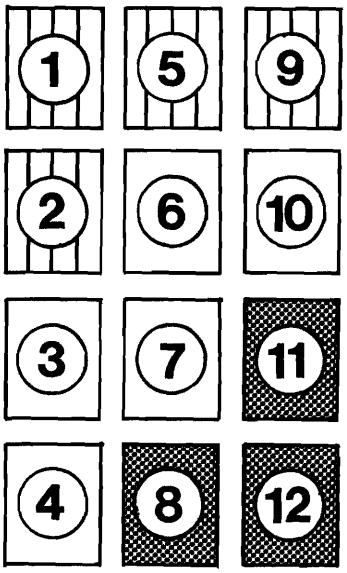
Find the answer to any question below in the boxes at the bottom of the page. Write the letter of that question in the box above its correct answer. Keep working and you will discover the answer to the title question.

A spinner is shown at the right. If the arrow is spun, what is the probability that it will stop on:



(E) a multiple of 3?
(N) a multiple of 2?
(A) a multiple of 3 *and* a multiple of 2?
(I) a multiple of 3 *or* a multiple of 2?

Suppose that one card is drawn at random from the 12 cards shown at the right. What is the probability that the card is:



(A) white?
(N) numbered with a multiple of 3?
(D) white *and* numbered with a multiple of 3?
(N) white *or* numbered with a multiple of 3?
(T) shaded?
(A) numbered with a number less than 10?
(N) shaded *and* numbered with a number less than 10?
(U) shaded *or* numbered with a number less than 10?

Pink and Purple Car Company owns the following cars: 1 pink Ford, 4 pink Chevrolets, 5 purple Fords, and 3 purple Chevrolets. If one of these cars is chosen at random, what is the probability that it is:

(A) a Ford?
(S) pink?
(B) pink *and* a Ford?
(L) pink *or* a Ford?

	PINK	PURPLE
FORD	1	5
CHEVROLET	4	3

$\frac{1}{10}$	$\frac{7}{12}$	$\frac{11}{12}$	$\frac{1}{3}$	$\frac{10}{13}$	$\frac{7}{10}$	$\frac{5}{13}$	$\frac{1}{4}$	$\frac{3}{10}$	$\frac{1}{6}$	$\frac{1}{13}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{6}{13}$	$\frac{1}{12}$	$\frac{5}{12}$

What Did The Electrician Say When His Son Came Home Late?

TO ANSWER THIS QUESTION, FOLLOW THESE INSTRUCTIONS: This puzzle contains 15 blocks of information and questions, called *FRAMES*. Read the frames in order. For each frame, select the correct answer from the two choices given. Write the letter of the correct choice in the box at the bottom of page 2 that contains the frame number.

1

Suppose you toss two coins at the same time. There is a certain probability of getting two heads. Or, suppose you roll two dice. There is a certain probability of getting a total of 7. This puzzle will help you figure out these probabilities.

First, let's consider tossing coins. How many outcomes are possible if you toss one coin?

(I) 2 outcomes (R) 4 outcomes

2

The answer to the first frame is, of course, *2 outcomes*. If you toss one coin, you get either a head or a tail. Each of these outcomes is *EQUALLY LIKELY*—that is, each will happen about as often as the other.

When you toss a coin, the probability of getting a head is 1 out of 2, or:

(E) $\frac{1}{2}$ (L) $\frac{1}{3}$

3

Suppose you toss a penny and a dime together. How many *EQUALLY LIKELY* outcomes are there? You might guess there are three: 2 heads; 2 tails; 1 head and 1 tail. This is incorrect. Actually, there are *FOUR* equally likely outcomes. They are listed at the right.

PENNY	DIME
heads	heads
tails	tails
heads	tails
tails	heads

Now, answer the question. How many equally likely outcomes are there when you toss a penny and a dime?

(A) 5 (S) 4

4

One outcome is getting 2 heads. Another outcome is getting 2 tails. The third outcome is getting penny heads and dime tails. The fourth outcome is getting penny tails and dime heads.

Since getting two heads is 1 of 4 equally likely outcomes, what is the probability of getting two heads?

(I) $\frac{1}{4}$ (M) $\frac{1}{2}$

5

What is the probability of getting two tails? (S) $\frac{1}{5}$ (E) $\frac{1}{4}$

6

The answer to both questions 4 and 5 is, of course, $\frac{1}{4}$. Now, what is the probability of getting 1 head and 1 tail? Remember, there are *TWO WAYS* to do this: penny heads and dime tails; penny tails and dime heads. So the probability is 2 out of 4, or:

(E) $\frac{1}{5}$ (O) $\frac{1}{2}$

7

If the probability of getting 1 head and 1 tail is $\frac{1}{2}$, then if you toss 2 coins together 100 times, about how many times would you expect to get 1 head and 1 tail?

(T) 30 (A) 50

8 The method we used for the coin problem has two steps: (1) listing all equally likely outcomes; and (2) seeing how many of these outcomes are in the *EVENT* we are talking about. An *EVENT* is a certain subset of outcomes, like getting 1 head and 1 tail.

Let's apply this method to dice rolling. How many equally likely outcomes are there if you roll 1 regular 6-faced die?

(U) 6 (R) 4

9 Suppose you roll two dice, 1 red and 1 green. We can make a chart to see all equally likely outcomes. This chart is at the right. The first number in each pair is on the red die; the second number is on the green die.

By counting the number of pairs, you discover how many equally likely outcomes there are. How many are there?

(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)
(2,1)	(2,2)	(2,3)	(2,4)	(2,5)	(2,6)
(3,1)	(3,2)	(3,3)	(3,4)	(3,5)	(3,6)
(4,1)	(4,2)	(4,3)	(4,4)	(4,5)	(4,6)
(5,1)	(5,2)	(5,3)	(5,4)	(5,5)	(5,6)
(6,1)	(6,2)	(6,3)	(6,4)	(6,5)	(6,6)

(S) 32 (Y) 36

10 Usually when you roll two dice, you are interested in the SUM of the two numbers you get. For example, red 1 and green 4 adds up to 5. But there are actually *FOUR* different ways to get a sum of 5: (red 1, green 4); (red 2, green 3); (red 3, green 2); (red 4, green 1).

So, of the 36 equally likely outcomes, four of them are sums of 5. The probability of getting 5 is 4 out of 36, or:

(T) $\frac{1}{9}$ (R) $\frac{1}{7}$

11 There is only one way to get a sum of 2. (Both dice have to come up 1.) So the probability of getting 2 is:

(L) $\frac{1}{36}$ (H) $\frac{5}{36}$

12 How many of the 36 outcomes are sums of 10? The probability of getting 10 is:

(F) $\frac{1}{6}$ (N) $\frac{1}{12}$

13 The probability of getting 8 is: (R) $\frac{5}{36}$ (T) $\frac{7}{36}$

14 The probability of getting 7 is: (F) $\frac{1}{4}$ (W) $\frac{1}{6}$

15 The method we used for both the coin problem and the dice problem has two steps. These two steps are: (1) listing all equally likely outcomes; and (2) seeing how many of those outcomes are:

(U) in the event we are talking about.

(G) not in the event we are talking about.

14	1	13	2	9	6	8	4	12	3	15	11	7	10	5	?