



## Topic 5 - Probability

1

A bag contains three colours of disc: red, blue and yellow.

There are an equal number of red discs and blue discs.

There are twice as many blue discs as yellow discs.

One disc is selected without looking.

What is the probability of selecting a blue disc?

**A**  $\frac{1}{5}$

**B**  $\frac{1}{4}$

**C**  $\frac{1}{3}$

**D**  $\frac{2}{5}$

**E**  $\frac{2}{3}$



2

Amrita has a bag of 36 marbles. Some are blue, some are red and the rest are yellow.

There are 16 blue marbles in the bag.

If she takes out a marble without looking, the probability that it is red is  $\frac{1}{2}$

How many yellow marbles are in the bag?

- A** 2
- B** 4
- C** 8
- D** 12
- E** 18



3

Jessica has blue, green, red and yellow buttons in a bag.

There are twice as many red buttons as blue buttons.

If she takes one button out of the bag without looking:

- the probability that it is blue is 0.2
- the probability that it is green is 0.3

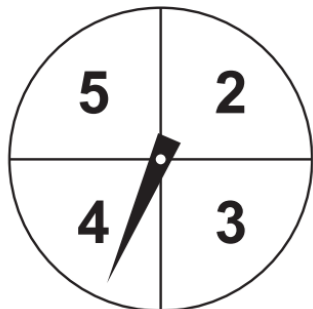
What is the probability that Jessica takes out a yellow button?

- A** 0.1
- B** 0.3
- C** 0.5
- D** 0.7
- E** 0.9



4

Chen has a spinner that is split into four equal sections.



He spins the spinner and it lands on 4.

Now Emily is going to spin the spinner once. Which of these statements are correct?

- X** The probability of Emily getting a 4 is  $\frac{1}{4}$
  - Y** The probability that Emily's number is less than Chen's is  $\frac{1}{2}$
  - Z** The probability that Emily and Chen's scores add up to make more than 5 is  $\frac{3}{4}$
- A** none of them
- B** statements X and Y only
- C** statements X and Z only
- D** statements Y and Z only
- E** statements X, Y and Z



5

A gardener has a box of bulbs to plant in a garden. The garden has three sections.

She plants  $\frac{1}{2}$  of the bulbs in the first section.

She plants  $\frac{3}{4}$  of the remaining bulbs in the second section.

She has 6 bulbs left, which she plants in the third section.

How many bulbs were in the box at the start?

**A** 16

**B** 18

**C** 24

**D** 32

**E** 48



6

Jason has 3 different pairs of trousers and 4 different shirts.

Emily has 2 different pairs of trousers and 5 different shirts.

Each person can make an outfit from their own clothes by choosing 1 pair of trousers and 1 shirt.

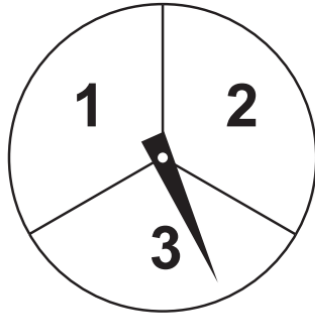
Who has a larger number of possible outfits, and by how many?

- A** Jason has 2 more outfits than Emily.
- B** Jason has 1 more outfit than Emily.
- C** They have the same number of outfits.
- D** Emily has 1 more outfit than Jason.
- E** Emily has 2 more outfits than Jason.



7

Aaron and Tom have a game where they each spin this spinner once, and whoever spins the higher number wins.



They play this game 8 times.

During the game:

- Aaron spins two 1s, three 2s and three 3s.
- Tom spins two 1s, five 2s and one 3.

There are no draws.

How many games does Aaron win?

- A** 2
- B** 4
- C** 5
- D** 6
- E** It is not possible to tell.



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## Answer Key

|   |  |
|---|--|
| 1 | D  |
| 2 | A  |
| 3 | <p>The probability that the button is blue is 0.2.</p> <p>There are twice as many red buttons as blue buttons, so the probability that the button is red must be <math>0.2 \times 2 = 0.4</math>.</p> <p>The probability that the button is green is 0.3.</p> <p>The probabilities of blue, green, red and yellow have to add up to 1 since those are all the possible outcomes.</p> $0.2 + 0.4 + 0.3 = 0.9$ $1 - 0.9 = 0.1$ <p>So the probability that Jessica takes out a yellow button is 0.1, and the correct answer is <b>A 0.1</b>.</p>  |
| 4 | <p>Checking each statement in turn:</p> <p><b>X</b> <i>The probability of Emily getting a 4 is <math>\frac{1}{4}</math></i></p> <p>There are four equal sections, one of which is '4', so the probability of Emily getting a 4 when she spins is <math>\frac{1}{4}</math>, so statement X is correct. (The outcome of Chen's spin does not affect the outcome of Emily's spin.)</p> <p><b>Y</b> <i>The probability that Emily's number is less than Chen's is <math>\frac{1}{2}</math></i></p> <p>Chen got a 4, so there are two numbers less than Chen's on the spinner (2 and 3).</p> <p>This means the probability Emily's number is less than Chen's is <math>\frac{2}{4}</math> which is equivalent to <math>\frac{1}{2}</math>, so statement Y is correct.</p> |
| 5 | E  |
| 6 | A  |
| 7 | C  |