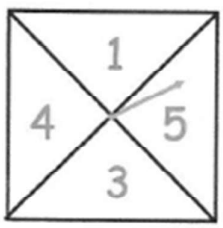
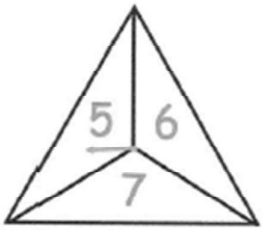
7. Two fair spinners are spun.

Spinner 1 has four equal sections labelled 1, 3, 4 and 5.
Spinner 2 has three equal sections labelled 5, 6 and 7.




Spinner 1




Spinner 2

Each spinner is spun once.
The numbers are added together to get a score.

(a) Complete the table to show all possible scores.

Spinner 1

| + | 1 | 3 | 4 | 5 |
|---|---|---|---|---|
| 5 | 6 | 8 | 9 | 10 |
| 6 | 7 | 9 | 10 | 11 |
| 7 | 8 | 10 | 11 | 12 |

Spinner 2

**(2)**

(b) Find the probability of scoring a 8

$\frac{2}{12}$ $\frac{1}{6}$

.....

**(1)**

(c) Find the probability of scoring an odd number

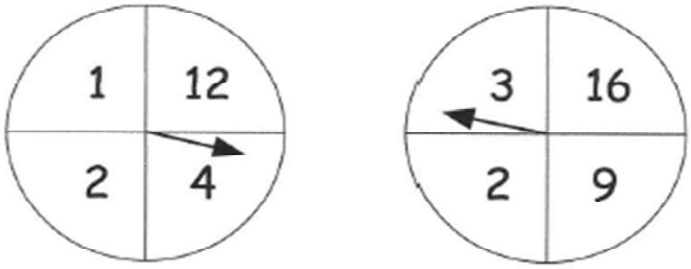
odd $\frac{5}{}$ even $\frac{7}{}$

$\frac{5}{12}$

.....

**(1)**

8. Anna has two fair spinners.




She spins both spinners and **multiplies** the numbers to get a score.

(a) Complete the table below to show all possible score.

Spinner B

| Spinner A \ X | 2 | 3 | 9 | 16 |
|---|---|---|---|---|
| 1 | (P) 2 | (P) 3 | (S) 9 | (S) 16 |
| 2 | (S) 4 | 6 | 18 | 32 |
| 4 | 8 | 12 | (S) 36 | (S) 64 |
| 12 | 24 | (S) 36 | 108 | 192 |

(P) = prime
(S) = square

**(2)**

Anna says that it is more likely that her score will be a **prime number** than a **square number**.

(b) Is Anna correct?
Explain your answer.

$P(\text{prime}) = \frac{2}{16} = \frac{1}{8}$

$P(\text{square}) = \frac{6}{16} = \frac{3}{8}$

No, the probability of a square number is greater than the probability of a prime number.

**(2)**

9. Two bags, 1 and 2, each contain counters that are equal size.


Bag 1 contains a pink counter, green counter and yellow counter.
Bag 2 contains counters labelled 2, 3, 4 and 5.
A counter is drawn at random from bag 1 and a counter is drawn at random from bag 2.

If the counter from bag 1 is pink, the number on the counter from bag 2 is doubled.
If the counter from bag 1 is green, one is added to the number on the counter from bag 2
If the counter from Bag 1 is yellow, the number on the counter from bag 2 stays the same.

(a) Complete the table to show all possible scores.

| Bag 2 \ Bag 1 | P | G | Y |
|---|---|---|---|
| 2 | 4 | 3 | 2 |
| 3 | 6 | 4 | 3 |
| 4 | 8 | 5 | 4 |
| 5 | 10 | 6 | 5 |

**(2)**

(b) Find the probability of scoring a multiple of 3

3, 6, 9, 12

$\frac{4}{12} = \frac{1}{3}$

$\frac{1}{3}$

.....

**(2)**

11. Two fair six-sided dice are rolled.
The score is **difference** between the numbers on each dice.

(a) Complete the table to show all possible scores.

| Dice 2 \ Dice 1 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 2 | 1 | 0 | 1 | 2 | 3 | 4 |
| 3 | 2 | 1 | 0 | 1 | 2 | 3 |
| 4 | 3 | 2 | 1 | 0 | 1 | 2 |
| 5 | 4 | 3 | 2 | 1 | 0 | 1 |
| 6 | 5 | 4 | 3 | 2 | 1 | 0 |

(b) Find the probability of scoring a 2

$\frac{8}{36} = \frac{4}{18} = \frac{2}{9}$

$\frac{2}{9}$

.....

**(1)**

(c) Find the probability of scoring a number less than 3

0, 1, 2

$\frac{24}{36} = \frac{2}{3}$

$\frac{2}{3}$

.....

**(2)**

12. A fair dice is numbered from 1 to 6.
The dice is rolled twice.

(a) Draw a sample space diagram to show the possible outcomes.

Dice 2

| Dice 1 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1 | 1,1 | 1,2 | 1,3 | 1,4 | 1,5 | 1,6 |
| 2 | 2,1 | 2,2 | 2,3 | 2,4 | 2,5 | 2,6 |
| 3 | 3,1 | 3,2 | 3,3 | 3,4 | 3,5 | 3,6 |
| 4 | 4,1 | 4,2 | 4,3 | 4,4 | 4,5 | 4,6 |
| 5 | 5,1 | 5,2 | 5,3 | 5,4 | 5,5 | 5,6 |
| 6 | 6,1 | 6,2 | 6,3 | 6,4 | 6,5 | 6,6 |

**(2)**

(b) Work out the probability that the number obtained on the first roll is more than double the score on the second roll.

3,1
4,1
5,1
5,2
6,1
6,2

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

$\frac{1}{6}$

**(2)**

13. James has organised a game to raise money for charity at a local fair.
He rolls a fair six sided dice and flips a fair coin.

If the coin lands on heads, the number on the dice is **squared**.
If the coin lands on tails, the number on the dice is **cubed**.

Each person pays 50p to play.
If they score above 30, they win £1
The game is played 450 times.

How much money does James raise for charity?

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| H | 1 | 4 | 9 | 16 | 25 | 36 |
| T | 1 | 8 | 27 | 64 | 125 | 216 |

36

$P(\text{over } 30) = \frac{4}{12} = \frac{1}{3}$

$\frac{1}{3}$ of 450 = 150 $\quad 150 \times £1 = £150$

$450 \times 50p = £225$

$225 - 150 = 75$

£75

.....

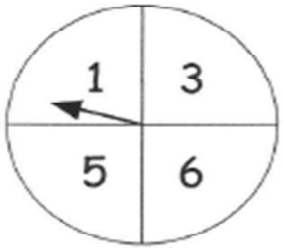
**(5)**

14. George has three cards, each with an algebraic expression written on it.

| $x + 1$ | $5x$ | $x^3$ |
|---|---|---|

He picks one of the cards at random.

Then he spins the following fair spinner.




George substitutes the number shown on the spinner into the algebraic expression on the card.

(a) Complete the table to show the possible results.

| | 1 | 3 | 5 | 6 |
|---|---|---|---|---|
| $x + 1$ | 2 | 4 | 6 | 7 |
| $5x$ | 5 | 15 | 25 | 30 |
| $x^3$ | 1 | 27 | 125 | 216 |

**(2)**

George picks a card at random and spins the spinner a total of 300 times.

(b) Estimate how many times George should get an **odd** result.

odd 7 even 5 $P(odd) = \frac{7}{12}$

$\frac{7}{12}$ of $300 = 175$

$300 \div 12 = 25$

$25 \times 7 = 175$

175

**(3)**