

P24- Probability and Sample Space Diagrams

OCR

14 A game uses two fair spinners.

Spinner A has 6 sides numbered 2, 4, 6, 6, 6 and 8.

Spinner B has 5 sides numbered 1, 3, 5, 7 and 9.

Both spinners are spun and the two scores are added together.

Show that the probability of getting a total of 7 is $\frac{1}{6}$.

[4]

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[4]

		Spinner A					
+		2	4	6	6	6	8
B	1	.		7	7	7	
	3		7				
	5	7					
	7						
	9						

$\frac{5}{30} = \frac{1}{6}$ ✓

8 Two fair 4-sided spinners are each numbered 1, 2, 3 and 4. Both spinners are spun and the numbers landed on are added. The possible totals are shown in the table.

		Spinner A			
		1	2	3	4
Spinner B	1	2	3	4	5
	2	3	4	5	6
	3	4	5	6	7
	4	5	6	7	8

(a) What is the probability of getting a total of 2?

(a) [1]

(b) Spinner A lands on 3.

Explain why it is not possible to get a total of 3.

[1]

(c) Which total has a probability of $\frac{1}{4}$?

Show how you decide.

(c) [2]

8 Two fair 4-sided spinners are each numbered 1, 2, 3 and 4. Both spinners are spun and the numbers landed on are added. The possible totals are shown in the table.

		Spinner A			
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Spinner B	1	2	3	4	5
	2	3	4	5	6
	3	4	5	6	7
	4	5	6	7	8

(a) What is the probability of getting a total of 2?

(a) $\frac{1}{16}$ [1]

(b) Spinner A lands on 3.

Explain why it is not possible to get a total of 3.

3 add any number will be bigger than 3. [1]

$5 = \frac{4}{16} = \frac{1}{4}$ ✓

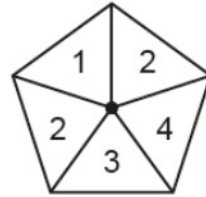
(c) Which total has a probability of $\frac{1}{4}$?

Show how you decide.

(c) 5 [2]

20 (a) This is a fair 5-sided spinner.

Video created by W Neill



Ciara spins the spinner twice and records the product of the two scores.

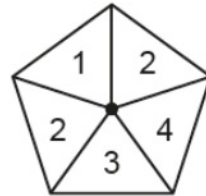
(i) Complete the table.

		First spin				
		x	1	2	2	3
Second spin	1	1				
	2			4		
	2					
	3					
	4				12	

(ii) Find the probability that the product is a multiple of 3.

20 (a) This is a fair 5-sided spinner.

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Ciara spins the spinner twice and records the product of the two scores.

(i) Complete the table.

		First spin					
		x	1	2	2	3	4
Second spin	1	1	2	2	3	4	
	2	2	4	4	6	8	
	2	2	4	4	6	8	
	3	3	6	6	9	12	
	4	4	8	8	12	16	

3, 6, 9, 12, 15, 18

$$\frac{9}{25} \checkmark$$

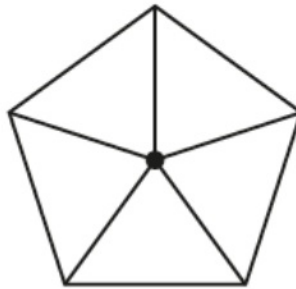
(ii) Find the probability that the product is a multiple of 3.

- (b) Ciara makes a different fair 5-sided spinner.
She spins the spinner twice and records the product of the two scores.

Ciara says

The probability that the product is negative is 0.48.

Write numbers on the spinner below so that Ciara's statement is correct.



[3]

- (b) Ciara makes a different fair 5-sided spinner. She spins the spinner twice and records the product of the two scores.

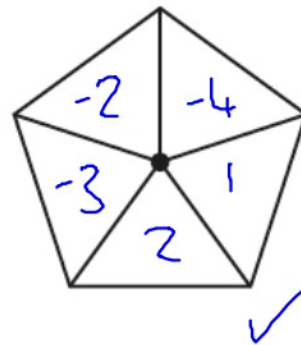
Ciara says

The probability that the product is negative is 0.48.

$$\frac{48}{100} \div 4 = \frac{12}{25}$$

Write numbers on the spinner below so that Ciara's statement is correct.

$$\begin{aligned} ++ &= + \\ -- &= + \\ +- &= - \\ -+ &= - \end{aligned}$$

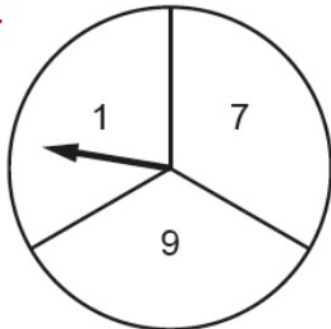


	-	-	-	+	+
-	+	+	+	-	-
-	+	+	+	-	-
-	+	+	+	-	-
+	-	-	-	+	+
+	-	-	-	+	+

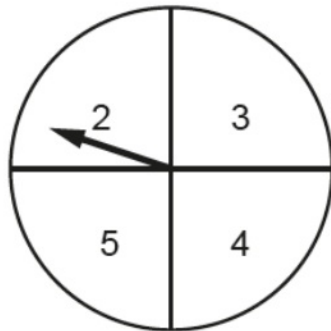
[3]

16 Geoff has two fair spinners.

P24



Spinner A



Spinner B

He spins both spinners and **multiplies** the numbers on each spinner.

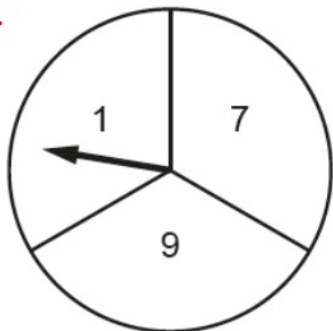
(a) Complete the table.

		Spinner A		
		1	7	9
Spinner B	2	2	14	18
	3	3	21	27
	4	4	28	
	5	5	35	

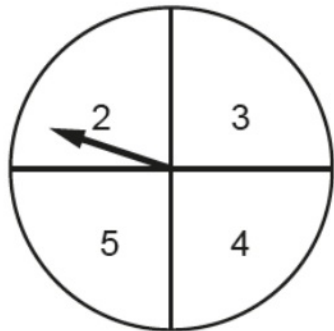
[1]

16 Geoff has two fair spinners.

P24



Spinner A



Spinner B

He spins both spinners and **multiplies** the numbers on each spinner.

(a) Complete the table.

		Spinner A		
		1	7	9
Spinner B	2	2	14	18
	3	3	21	27
	4	4	28	36
	5	5	35	45

even
or
prime

$\frac{6}{12}$

$\frac{3}{12}$

$\frac{8}{12}$

[1]

- (b) Geoff wants to work out the probability that the outcome of the multiplication is an even number or a prime number.
Here is his working.

The probability the outcome is an even number is $\frac{6}{12}$.

The probability the outcome is a prime number is $\frac{3}{12}$.

The probability the outcome is an even number or a prime number is $\frac{6}{12} + \frac{3}{12} = \frac{9}{12}$.

Geoff is wrong.

Explain his error and give the correct answer.

.....

..... [2]

- (b) Geoff wants to work out the probability that the outcome of the multiplication is an even number or a prime number.
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The probability the outcome is an even number or a prime number is $\frac{6}{12} + \frac{3}{12} = \frac{9}{12}$.

Geoff is wrong.

Explain his error and give the correct answer.

2 is even and prime. Geoff has counted this twice.

Correct answer $\frac{8}{12}$ ✓ [2]

8 Hannah wants to display all the possible outcomes when rolling two fair 6-sided dice. Created by W Neill

P24 (a) Give a reason why a tree diagram is not the best method to use.

..... [1]

(b) (i) Draw a sample space to display all the possible outcomes. [2]

(ii) Show that the probability of the scores on the two dice adding to 11 is $\frac{1}{18}$.

8 Hannah wants to display all the possible outcomes when rolling two fair 6-sided dice. Created by W Neill

P24 (a) Give a reason why a tree diagram is not the best method to use.

too many branches



[1]

(b) (i) Draw a sample space to display all the possible outcomes. ^{Dice 2}

[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

(ii) Show that the probability of the scores on the two dice adding to 11 is $\frac{1}{18}$.

$$\frac{2}{36} = \frac{1}{18} \quad \checkmark$$

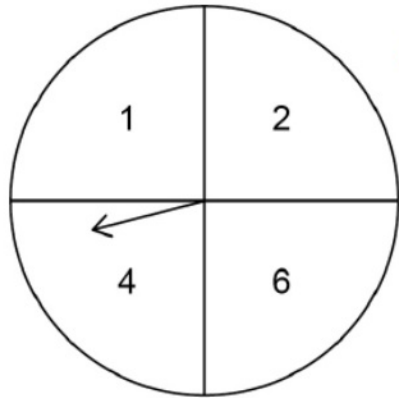
AQA

13

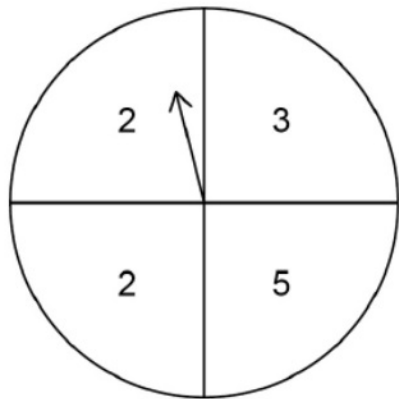
In a game, two fair spinners are spun.

Video created by W Neill

P24 Spinner A



Spinner B



If the numbers the arrows land on are different, the score is the **higher** number.
 If the numbers the arrows land on are the same, the score is 0

13 (a) Complete the table to show the possible scores.
 [2 marks]

		Spinner B			
		2	2	3	5
Spinner A	1	2			
	2		0		
	4				
	6				

13 (b) Write down the probability that the score is an **odd** number.

[1 mark]

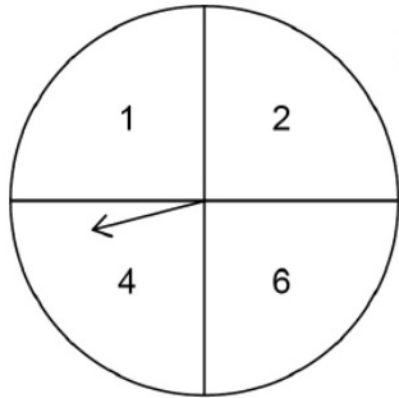
Answer _____

13

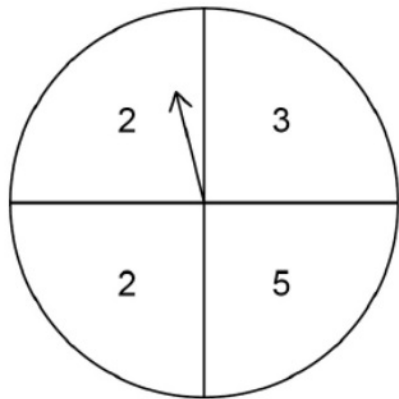
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P24 Spinner A



Spinner B



If the numbers the arrows land on are different, the score is the **higher** number.
 If the numbers the arrows land on are the same, the score is 0

13 (a) Complete the table to show the possible scores.
 [2 marks]

		Spinner B			
		2	2	3	5
Spinner A	1	2	2	3	5
	2	0	0	3	5
	4	4	4	4	5
	6	6	6	6	6

13 (b) Write down the probability that the score is an **odd** number.

Answer 5/16 [1 mark]