

Skill

Group A - Probability scales

Indicating probabilities on a probability scale:

1) A fair 4-sided spinner numbered 2, 3, 5, and 8 is spun.

a. Mark with a (X) the probability of the spinner landing on an even number.



b. Mark with a (X) the probability of the spinner landing on a prime number.



2) Five cards spelling the word "TIMES" are shuffled and one card is selected at random.

a. Mark with a (X) the probability of selecting a vowel.





4) Ten cards numbered 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are shuffled and a card is taken at random.



Group B - Calculating simple probabilities and the probability of something *not* **happening.** Calculate the probabilities of the random events, give your answer as fractions, decimals or percentages:

 A bag contains 3 red counters and 5 blue counters. Find the probability of selecting a blue counter. 	2) A bag contains 2 red counters, 3 blue counters and 1 yellow counter. Find P(yellow or red).	3) A fair 5-sided spinner is numbered 1 to 5. Find the probability of it landing on an even number.
4) A bag contains 4 green counters and 6 white counters. Find the probability of not selecting a white counter.	5) A box of chocolates contains 4 white chocolates, 6 milk chocolates and 3 dark chocolates. Find P(not milk).	6) A pack of pens contains 3 red pens, 2 green pens, 5 blue pens and 6 black pens. Find P(red or blue).
7) A fair 6-sided die is rolled. Find the probability of not rolling a multiple of 4.	8) A weather report claims the probability of snow tomorrow is 72%. What is the probability of it not snowing tomorrow?	9) A bag contains 5 white counters, 7 black counters and 3 red counters. Find P(not red).



Group C - Sample space

Complete the sample space diagram and find the probability:

1) The two fair spinners shown are spun and their scores added together.



		_
$\overline{\ }$	2	1
1	Х з	
	4	
7		

a. Complete the sample space diagram for the possible outcomes.

	1	2	3
1	2	3	
2	3		
3	4		
4			

b. Find P(score less than 5)

2) A fair coin is flipped and a fair 3-sided spinner numbered 1, 2, 3 is spun. If the coin shows Heads the score on the spinner is doubled. If the coin shows tails the score on the spinner remains the same.

a. Complete the sample space diagram for the possible outcomes.

	1	2	3
н	2		
Т	1		

b. Find P(even score)

3) The two fair spinners shown are spun and their scores multiplied together.





4) The two fair spinners shown are spun and their colours recorded.





a. Complete the sample space diagram for the possible outcomes.

	2	3	6
1	2	3	
5	10		
7			
9			

b. Find P(score greater than 30)

a. Complete the sample space diagram for the possible outcomes.

	Red	White	Green
Red		R, W	
Blue			
Yellow			
Green			G, G

b. Find P(at least one Green)



Applied

- 1) There are only white and green counters in a bag. The probability of selecting a white counter is twice that of selecting a green counter.
 - (a) Find the probability of selecting a green counter.
 - (b) Explain why there cannot be 9 white counters in the bag.
- 2) A bag contains only blue, yellow and red counters. The probability of selecting a blue counter is $\frac{1}{3}$ and the probability of selecting a red counter is $\frac{2}{5}$
 - (a) Find the smallest number of counters they may be in the bag.
 - (b) If there are between 21 and 26 blue counters in the bag, find the number of yellow counters.
- **3)** A 20p coin, a 10p coin and a 5p coin are flipped in a game. Each coin is fair and can show heads or tails.

20p	10p	5p
н	н	н
н	н	т

(a) Complete the table to show the different combinations.

(b) A player wins the game if the total value of the coins showing Tails is greater than 20p. Find the probability of winning the game.



4) A point is randomly selected from the coordinate grid shown. Each point can only take integer values from 0 to 5, e.g. (2, 4) or (1, 0).



- (a) A point is chosen at random.Find the probability that the point has the x-coordinate which is 4.
- (b) Another point is chosen at random.Find the probability the point has the same x and y coordinates.
- (c) Another point is chosen at random. Find the probability the point lies on the line with equation y = 2x + 1.

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Sample space - Exam Questions

1) A weather report states that there is a 33% probability of rain. What is the probability of it **not** raining?

A bag contains 30 counters. 7 are red, 11 are green and the rest are blue or white. There are twice as many blue counters as white counters. A counter is selected at random. Find the probability of selecting a white counter.

3) A 4 sided spinner numbered 1, 2, 3 and 4 and a 3 sided spinner numbered 5, 7 and 9 are spun and the values on each added together.

(a) Complete the sample space diagram to find the possible outcomes.

	1	2	3	4
5	6	7		
7	8			
9				

(b) Find the probability that the sum of the values is prime.

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(2 marks)

(3 marks)

(2)

(2)

6

(4 marks)



THIRD SPACE



Sample space - Exam Questions

4) A combination lock has three dials each numbered 1, 2 and 3.



John has forgotten his combination but he remembers that exactly two of the numbers are the same.

(a) Write a list of the possible combinations.

(3)

(b) Find the probability of the combination numbers having a sum of 5.

(2) (5 marks)

7



	Question	Answer
	Skill Questions	
Group A	 A fair 4-sided spinner numbered 3, 5, and 8 is spun. 	1)
	a. Mark with a (X) the probability of the spinner landing on an even number. o $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 b. Mark with a (X) the probability of the spinner landing on a prime number. o $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1	a. $\frac{1}{2}$
	2) Five cards spelling the word "TIMES" are shuffled and one card is selected at random. a. Mark with a (X) the probability of selecting a vowel. 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +	2) a. $\frac{2}{5}$ $\begin{array}{c} & & \\ & & \\ & & \\ 0 & \frac{1}{5} & \frac{2}{5} & \frac{3}{5} & \frac{4}{5} & 1 \end{array}$ b. $\frac{1}{5}$ $\begin{array}{c} & & \\ & & \\ 0 & \frac{1}{5} & \frac{2}{5} & \frac{3}{5} & \frac{4}{5} & 1 \end{array}$







Group B	5) A box o	f chocolate	es contain	S	5) -	7				
contd	4 white ch	ocolates, 6	milk cho	colates		13				
	and 3 dark	chocolate	S.							
	Find P(not	milk).								
	6) A pack (of pens co	ntains 3 re	ed pens, 2	6) ·	$\frac{8}{16}$ or $\frac{1}{2}$	<u>.</u> ?			
	green pens	s, 5 blue pe	ens and 6	black						
	pens. Find	P(red or b	lue)							
	7) A fair 6-sided die is rolled. Find the				7) ·	<u>5</u> 6				
	probability of not rolling a multiple of 4.									
	8) A weather report claims the				8) 2	28%				
	probability of snow tomorrow is 72%.									
	What is th	e probabil	ity of it no	ot						
	snowing to	omorrow?				10 /				
	9) A bag c	ontains 5 v	white cour	nters, 7	9)	$\frac{12}{15}$ or $\frac{4}{5}$	<u>+</u>			
	black coun	ters and 3	red count	ters.						
	Find P(not	red).								
Group C	1) The two	o fair spinr	ners show	n are	1)					
Group C	1) The two spun and t	o fair spinr their score	ners show s added to	n are ogether.	1)					
Group C	1) The two spun and t	o fair spinr their score	ners show s added to 1	n are ogether. 2 3 4	1)					
Group C	 1) The two spun and the spun and th	o fair spinr their score	ners show s added to 1	n are ogether. 2 3 4	1) a.					
Group C	 1) The two spun and the spun and th	o fair spinr their score te the sam	ners show s added to 1 ple space somes.	n are ogether. 2 3 4	1) a.		1	2	3	
Group C	 1) The two spun and the spun and th	o fair spinr their score te the sam ssible outc	ners show s added to 1 ple space omes. 2	n are ogether. 2 3 4 e diagram	1) a.	1	<mark>1</mark> 2	2 3	34	
Group C	 1) The two spun and the spun and th	o fair spinr their score te the sam ssible outc 1 2	ners show s added to 1 nple space comes. 2 3	n are ogether. 2 3 4 e diagram 3	1) a.	1 2	1 2 3	2 3 4	3 4 5	
Group C	 1) The two spun and the spun and th	their spinr their score te the sam ssible outco 1 2 3	ners show s added to 1 nple space comes. 2 3	n are ogether. 2 3 4 e diagram 3	1) a.	1 2 3	1 2 3 4	2 3 4 5	3 4 5 6	
Group C	 1) The two spun and the spun and th	te the same sible outco	ners show s added to ple space omes. 2 3	n are ogether. 2 3 4 e diagram 3	1)	1 2 3 4	1 2 3 4 5	2 3 4 5 6	3 4 5 6 7	
Group C	 1) The two spun and the spun and th	te the same sible outco	ners show s added to ple space omes. 2 3	n are ogether. 2 3 4 e diagram 3	1) a.	1 2 3 4	1 2 3 4 5	2 3 4 5 6	3 4 5 6 7	



Group C contd	2) A fair co 3-sided sp spun. If the coin the spinne If the coin spinner re a. Comple	bin is flipp inner num shows He r is double shows tai mains the te the sam	ed and a f abered 1, 2 eads the so ed. Is the scor same. aple space	fair 2, 3 is core on re on the e diagram	2) a.				
			unies.				1	2	3
		1	2	3		н 	2	4	6
		2				I	T	2	3
	b. Find P(e	even score)		b.	$\frac{4}{6}$ or $\frac{2}{3}$			
	3) The two spun and t	o fair spinr heir score	ners show s multiplie	n are ed	3)				
		6 to the corr		5 7 9					
	a. Comple	te the sam	iple space	e diagram	a.				
	for the pos		omes.				2	3	6
		2	3	6		1	2	3	6
		2 10	3			5	10	15	30
	5	10				7	14	21	42
	/ 0					9	18	27	54
	b. Find P(s	score grea	ter than 30	0)	b.	$\frac{2}{12}$ or $\frac{1}{6}$	-		



4) The two spun andW Ra. Completing the second second	o fair spin their colou	ners show urs record	vn are ed. B G Y C	4) a.			
for the po	ssible out	comes.			Red	White	
	Red	White	Green				Green
				Red	R,R	R,W	Green R,G
Red		R, W		Red Blue	R,R B,R	R,W B,W	R,G B,G
Red Blue		R, W		Red Blue Yellow	R,R B,R Y,R	R,W B,W Y,W	Green R,G B,G Y,G
Red Blue Yellow		R, W		Red Blue Yellow Green	R,R B,R Y,R G,R	R,W B,W Y,W G,W	Green R,G B,G Y,G G,G
Red Blue Yellow Green		R, W	G, G	Red Blue Yellow Green	R,R B,R Y,R G,R	R,W B,W Y,W G,W	Green R,G B,G Y,G G,G



	Qu	estion	An	Answer					
	Арр	olied Questions							
1)		There are only white and green counters in a bag. The probability of selecting a white counter is twice that of selecting a green counter.							
	a)	Find the probability of selecting a green counter.	a)	$\frac{1}{3}$					
	b)	Explain why there cannot be 9 white counters in the bag.	b)	Must be an even number of white counters.					
2)		A bag contains only blue, yellow and red counters. The probability of selecting a blue counter is $\frac{1}{3}$ and the probability of selecting a red counter is $\frac{2}{5}$.							
	a)	Find the smallest number of counters they may be in the bag.	a)	LCM of 3 and 5 is 15					
	b)	If there are between 21 and 26 blue counters in the bag, find the number of yellow counters.	b)	$\frac{1}{3} \times 15$ $\frac{2}{5} \times 15$ Total num multiple o	= 5 yello = 6 red c ber of cou f 15.	w counter counters inters mus	rs st be a		
				В	Y	R	Total		
				5		6	15		
				10		12	30		
				15		18	45 60		
				20		24 30	75		
				75 – 25	- 30 =	20			







Sample space - Mark Scheme

		Quest	ion				An	swer					
		Exam (Questic	ons									
1)		A weather report states that there is a 33% probability of rain. What is the probability of it not raining?						100% - 33% or 1 - 0.33 67% or 0.67 oe					
2)		A bag co 11 are g white. T counters is select Find the	ontains reen and here are as white ed at ran probab	30 cound d the reset twice a te count adom. ility of s	iters. 7 st are bl as many ers. A c selectin	are red, ue or blue counter g a	$12 \div (2 + 1)$ Finding that there are 8 blue or 4 white counters $\frac{4}{30} \mathbf{oe}$					(1)(1)(1)	
3)	(a)	A 4 sided spinner numbered 1, 2, 3 and 4 and a 3 sided spinner numbered 5, 7 and 9 are spun and the values on each added together. Complete the sample space diagram to find the possible outcomes.						(a) 3 more values are filled in Table complete with correct values					(1)
		-	1	2	3	4			1	2	3	4	
		5	6	/				5	6	7	8	9	
		9	0					7	8	9	10	11	
								9	10	11	12	13	J
((b)	Find the probability that the sum of the values is prime.					(b) Finds the prime numbers 7, 11, 13 or uses 4 as the numerator $\frac{4}{12}$ oe					(1) (1)	



Sample space - Mark Scheme

4) (a)	A combination lock has three dials each numbered 1, 2 and 3. Total State 1, 2 and 3. Total State 2, 2 and 3. John has forgotten his combination but he remembers that exactly two of the numbers are the same. Write a list of the possible combinations.	(a)	Evidence of stausing with 1, 1 At least 12 diff All 18 correct 1,1,2 1,2,1 2,1,1 1,1,3 1,3,1 3,1,1	arting to list c ., 2, 2, 3, 3 ferent combin combinations 2,2,1 2,1,2 1,2,2 2,2,3 2,3,2 3,2,2	ombinations 3, ations 3,3,1 3,1,3 1,3,3 1,3,3 3,3,2 3,2,3 2,3,3	(1) (1) (1)	
(b)	Find the probability of the combination numbers having a sum of 5.	(b) A fraction with a numerator 5 or a denominator 18 $\frac{6}{18}$ oe					

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