THIRD SPACE LEARNING

GCSE Exam Questions

Probability Distributions | Probability

GCSE Exam Questions: Probability Distributions

1) A bag contains only white, yellow and red counters. There are three times as many yellow counters as white counters and twice as many red counters as yellow counters.

A counter is selected at random.

Fill in the table to show the probability distribution for the bag of counters.

Colour	White	Yellow	Red
Probability			

(4 marks)

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2) Ben flipped a coin 20 times and recorded the results.

Side	Frequency
Heads	16
Tails	4

(a) Ben says, "the coin must be biassed because I got a lot more heads than tails".

Explain why Ben's statement might be wrong.

(1)

(b) Fred takes the same coin and flips it another 80 times and records the results.

Side	Frequency
Heads	32
Tails	48

Use the information to complete the table for the probability distribution for the coin.

Side	Head	Tail
Probability		

(4 marks)

GCSE Exam Questions: Probability Distributions

3) The table shows the probability distribution for a bag containing only red, yellow, blue and green counters.

Number	Red	Yellow	Blue	Green
Probability	0.25	0.05	0.3	0.4

The spinner is spun 400 times.

How many times would it be expected to land on blue or yellow?

(3 marks)

4) The table shows the probability of winning cash prizes from an arcade game.

Prize	0p	10p	50p	£1
Probability	0.5	0.3	0.15	0.05

It costs 20p to play the game. Abbie plays the game 300 times.

Calculate the profit or loss that Abby will make, stating clearly whether it is a profit or loss.

(5 marks)

GCSE Exam Questions: Probability Distributions Answers

<table>
<tr><th></th><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1)</td><td>A bag contains only white, yellow and red counters. There are twice as many red counters as yellow counters and three times as many yellow counters as white counters.

A counter is selected at random.
Fill in the table to show the probability distribution for the bag of counters.

<table><tr><th>Colour</th><th>White</th><th>Yellow</th><th>Red</th></tr><tr><td>Probability</td><td></td><td></td><td></td></tr></table></td><td>Process of forming a ratio or equation linking amounts of white, yellow and red counters, eg W:Y:R = 1:3:6 oe

P(white) = 0.1 oe
P(yellow) = 0.3 oe
P(red) = 0.6 oe

<table><tr><th>Colour</th><th>White</th><th>Yellow</th><th>Red</th></tr><tr><td>Probability</td><td>0.1</td><td>0.3</td><td>0.6</td></tr></table></td><td>(1)

(1)
(1)
(1)</td></tr>
<tr><td>2)

(a)</td><td>Ben flipped a coin 20 times and recorded the results.

<table><tr><th>Side</th><th>Frequency</th></tr><tr><td>Heads</td><td>16</td></tr><tr><td>Tails</td><td>4</td></tr></table>
Ben says, “the coin must be biassed because I got a lot more heads than tails”. Comment on Ben’s statement.</td><td>(a) 20 times is not enough trials oe</td><td>(1)</td></tr>
<tr><td>(b)</td><td>Fred takes the same coin and flips it another 80 times and records the results.

<table><tr><th>Side</th><th>Frequency</th></tr><tr><td>Heads</td><td>32</td></tr><tr><td>Tails</td><td>48</td></tr></table>
Use the information to complete the table for the probability distribution for the coin.

<table><tr><th>Side</th><th>Head</th><th>Tail</th></tr><tr><td>Probability</td><td></td><td></td></tr></table></td><td>(b) Total number of heads = 16 + 32 = 48
Total number of tails = 4 + 48 = 52

P(heads) = $\frac{48}{100}$ oe

P(tails) = $\frac{52}{100}$ oe

<table><tr><th>Side</th><th>Head</th><th>Tail</th></tr><tr><td>Probability</td><td>0.48</td><td>0.52</td></tr></table></td><td>(1)
(1)

(1)

(1)</td></tr>
</table>

GCSE Exam Questions: Probability Distributions Answers

	Question	Answer	Marks
3)	The table shows the probability distribution for a bag containing only red, yellow, blue and green counters. **Number** / **Red** / **Yellow** / **Blue** / **Green** Probability / 0.25 / 0.05 / 0.3 / 0.4 The spinner is spun 400 times. How many times would it be expected to land on blue or yellow?	$0.05 + 0.3 = 0.35$ 0.35×400 140	**(1)** **(1)** **(1)**
4)	The table shows the probability of winning cash prizes from an arcade game. **Prize** / **0p** / **10p** / **50p** / **£1** Probability / 0.5 / 0.3 / 0.15 / 0.05 It costs 20p to play the game. Abbie plays the game 300 times. Calculate the profit or loss that Abby will make, stating clearly whether it is a profit or loss.	$20 \times 300 = 6000$, 6000*p* or £60 10p: 300×0.3 x £0.10 = £9 **or** 50p: 300×0.15 x £0.50 = £22.50 **or** £1: 300×0.05 x £1.00 = £15 £9 + £22.50 + £15 winnings £46.50 £60 - £46.50 = £13.50 Loss **and** £13.50	**(1)** **(1)** **(1)** **(1)** **(1)**

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