



THIRD SPACE
LEARNING

GCSE Exam Questions

Types of Sampling | Statistics

GCSE Exam Questions: Types of Sampling

- 1) (a) A pharmaceutical company is testing a new drug. 1000 people are participating in the clinical trials. 350 people will receive a placebo proportional to the population.

Age (x years)	Male	Female
$18 \leq x < 30$	225	253
$30 \leq x < 50$	162	134
$x \geq 50$	121	105

How many adults over 50 years old received the placebo?

(3)

- (b) How many females between 18 and 30 years old will receive the new drug for the trial?

(2)

(5 marks)

- 2) (a) A supermarket would like to find out how much money their customers spend on average per week. On average, they have 12,000 customers per week. They decide to ask a sample of 1500 customers as they enter the store, chosen using a systematic sampling technique. Calculate the interval to select each data entry for the research.

(1)

- (b) What are the disadvantages of using this type of sampling technique with customers entering the store?

(1)

(2 marks)

GCSE Exam Questions: Types of Sampling

- 3) (a) A private golf club would like to find out how many times their members play golf per week. The club has three types of memberships: Bronze, Silver, and Gold. They decide to take a stratified sample of 500 members proportional to their type of membership.

	Bronze	Silver	Gold
Frequency	440	612	348

How many members will be chosen from each type of membership?

(5)

- (b) The members are selected using a systematic sample within each category. Calculate the interval for the sample for the Bronze membership category.

(1)
(6 marks)

GCSE Exam Questions: Types of Sampling

- 4) A flower shop sold 325 bouquets of flowers for Valentine's Day. They take a sample of their customers, stratified by the feature flowers in their bouquets. The table below shows some of the information about the sample.

	Roses	Lilies	Carnations	Total
Number Sold	200			325
Number in Sample	8	4		

- (a) Complete the table

(5)

- (b) Will the sample give an accurate representation of the population?

Explain your answer.

(2)

(7 marks)

GCSE Exam Questions: Types of Sampling Answers

	Question	Answer	Marks														
1) (a)	A pharmaceutical company is testing a new drug. 1000 people are participating in the clinical trials. 350 people will receive a placebo proportional to the population. <table border="1"><thead><tr><th>Age (x years)</th><th>Male</th><th>Female</th></tr></thead><tbody><tr><td>$18 \leq x < 30$</td><td>225</td><td>253</td></tr><tr><td>$30 \leq x < 50$</td><td>162</td><td>134</td></tr><tr><td>$x \geq 50$</td><td>121</td><td>105</td></tr></tbody></table> How many adults over 50 years old receive the placebo?	Age (x years)	Male	Female	$18 \leq x < 30$	225	253	$30 \leq x < 50$	162	134	$x \geq 50$	121	105	Adults over 50 = 226 $\frac{226}{1000} \times 350 = 79.1$ 79 adults over 50	(1) (1) (1)		
		Age (x years)	Male	Female													
		$18 \leq x < 30$	225	253													
		$30 \leq x < 50$	162	134													
$x \geq 50$	121	105															
(b)	How many females between 18 and 30 years old will receive the new drug for the trial?	$\frac{253}{1000} \times 350 = 88.55$ 89 females	(1) (1)														
2) (a)	A supermarket would like to find out how much money their customers spend on average per week. On average, they have 12,000customers per week. They decide to ask a sample of 1500 customers as they enter the store, chosen using a systematic sampling technique. Calculate the interval to select each data entry for the research.	$\frac{12000}{1500} = 8$	(1)														
(b)	What are the disadvantages of using this type of sampling technique with customers entering the store?	People may not want to participate in the study and so values may be empty.	(1)														
3) (a)	A private golf club would like to find out how many times their members play golf per week. The club has three types of memberships: Bronze, Silver, and Gold. They decide to take a stratified sample of 500 members proportional to their type of membership. <table border="1"><thead><tr><th></th><th>Bronze</th><th>Silver</th><th>Gold</th></tr></thead><tbody><tr><td>Frequency</td><td>440</td><td>612</td><td>348</td></tr></tbody></table> How many members will be chosen from each type of membership?		Bronze	Silver	Gold	Frequency	440	612	348	Population = 1400 $\frac{500}{1400} = \frac{5}{14} = 0.357...$ $440 \times \frac{5}{14} = 157$ $612 \times \frac{5}{14} = 219$ $348 \times \frac{5}{14} = 124$ <table border="1"><thead><tr><th>B</th><th>S</th><th>G</th></tr></thead><tbody><tr><td>157</td><td>219</td><td>124</td></tr></tbody></table>	B	S	G	157	219	124	(1) (1) (1) (1)
			Bronze	Silver	Gold												
		Frequency	440	612	348												
		B	S	G													
157	219	124															
(b)	The members are selected using a systematic sample within each category. Calculate the interval for the sample for the Bronze membership category.	$\frac{440}{157} = 2.8$ Population = 1400	(1)														

GCSE Exam Questions: Types of Sampling Answers

	Question	Answer	Marks																							
4) (a)	<p>A flower shop sold 325 bouquets of flowers for Valentine’s Day. They take a sample of their customers, stratified by the feature flowers in their bouquets. The table below shows some of the information about the sample.</p> <table><tr><td></td><td>Roses</td><td>Lilies</td><td>Carnations</td><td>Total</td></tr><tr><td>Number Sold</td><td>200</td><td></td><td></td><td>325</td></tr><tr><td>Number in Sample</td><td>8</td><td>4</td><td></td><td></td></tr></table> <p>Complete the table</p>		Roses	Lilies	Carnations	Total	Number Sold	200			325	Number in Sample	8	4			<table><tr><td>200</td><td>100</td><td>25</td><td>325</td></tr><tr><td>8</td><td>4</td><td>1</td><td>13</td></tr></table> <p>4 25 = 100 Lilies</p> <p>325 - (200 + 100) = 25 Carnations</p> <p>25 25 = 1 Carnations in sample</p> <p>8 + 4 + 1 = 13 Total in sample</p>	200	100	25	325	8	4	1	13	<p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(1)</p> <p>(1)</p>
			Roses	Lilies	Carnations	Total																				
		Number Sold	200			325																				
		Number in Sample	8	4																						
		200	100	25	325																					
8	4	1	13																							
(c)	<p>Will the sample give an accurate representation of the population? Explain your answer.</p>	<p>No</p> <p>The sample is too small</p>	<p>(1)</p> <p>(1)</p>																							

Where to go next?

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