

Question			Answer	Marks	AOs		Guidance
12	(a)		$0.94^n < k$ or $0.06^n < k$ seen  $k = 0.025$ used in inequality as above  60	<b>M1</b>  <b>B1</b>  <b>A1</b>  <b>[3]</b>	<b>3.4</b>  <b>1.1</b>  <b>2.2a</b>	NB 59.617.. or 1.311...to 1 or more dp if unsupported implies <b>M1B1</b>	allow = instead of <   60 unsupported or from trial and improvement scores 3

Question			Answer	Marks	AOs		Guidance
12	(b)		<p><math>H_0 : p = 0.06</math> allow equivalent in words  <math>H_1 : p \neq 0.06</math>  <math>p</math> is the probability that a <b>jaguar</b> chosen at random is a <b>black</b> panther / has <b>black</b> coat</p> <p>use of B(83, 0.06) to obtain <math>P(X \leq K)</math> oe</p> <p><math>\text{cdfBinomial}(83, 0.06, 9) = 0.973</math> to 0.97321...  or <math>1 - \text{cdfBinomial}(83, 0.06, 9) = 0.02679</math> to 0.027</p> <p><math>1 -</math> their <math>P(X \leq K)</math> compared with 0.025 or their <math>P(X \leq K)</math> compared with 0.975 oe</p> <p>result is not significant or do not reject <math>H_0</math> or reject <math>H_1</math></p> <p>there is insufficient evidence at the 5% level to <b>suggest</b> that the probability that a <b>jaguar</b> selected at random from this population is a <b>black panther</b> is not 0.06</p>	<p><b>B1</b></p> <p><b>B1</b></p> <p><b>M1*</b></p> <p><b>A1</b></p> <p><b>M1dep*</b></p> <p><b>A1</b></p> <p><b>A1</b></p> <p><b>[7]</b></p>	<p><b>1.1</b></p> <p><b>2.5</b></p> <p><b>3.3</b></p> <p><b>1.1</b></p> <p><b>3.4</b></p> <p><b>1.1</b></p> <p><b>2.2b</b></p>	<p><b>or</b> <math>p</math> is the proportion of <b>jaguars</b> that are <b>black</b> panthers / have a <b>black</b> coat</p> <p>not <math>P(X = K)</math></p> <p>or critical region is <math>X \geq 11</math> (ignore lower tail)</p> <p>eg 10 compared with their critical region oe</p> <p>must have the correct probability or correct critical region for the last two <b>A</b> marks</p>	<p>NB <math>P(X \leq 10) = .98927\dots</math></p> <p>for comparison of their <math>P(X &gt; K)</math> with 0.025 or their <math>P(X \leq K)</math> with 0.975 or stating whether 10 is in their critical region</p> <p>allow accept <math>H_0</math></p> <p>do not allow eg conclude / prove / indicate or other assertive statement instead of suggest</p>