



## Solutions

1.

$H_0 : p = 0.5$	<b>M1</b>
$H_1 : p > 0.5$	<b>M1</b>
$X \sim B(30, 0.5)$	<b>M1</b>
$P(X \geq 21) = 1 - P(X \leq 20)$ $= 1 - 0.9786$	<b>M1</b>
$= 0.0214$	<b>M1</b>
Therefore, value is significant and we reject the $H_0$	<b>M1</b>
This suggests that David claim is incorrect and the weather forecast produced by the local radio is better than those achieved by tossing/flipping a coin.	<b>M1</b>





## Solutions

1a.

$X \sim B(25, 0.5)$	<b>M1</b>
$P(X \leq 7) = 0.0216$ $P(X \geq 18) = 0.0216$	<b>M1</b>
Therefore, critical region, $X \leq 7$ ; U $X \geq 18$	<b>M1</b>

1b.

$P(\text{rejecting } H_0) = 0.0216 + 0.0216$	<b>M1</b>
$= 0.0432$	<b>M1</b>





## Solutions

1a.

$X \sim B(20, 0.3)$	<b>M1</b>
$P(X \leq 2) = 0.0355$ , $P(X \leq 1) = 0.0076$	<b>M1</b>
$P(X \geq 11) = 1 - 0.9829 = 0.0171$	<b>M1</b>
Therefore critical region is $(X \leq 1) \cup (X \geq 11)$	<b>M1</b>

1b.

Significance level = $0.0076 + 0.0171$	<b>M1</b>
= 0.0247 (or 2.47%)	<b>M1</b>

1c.

Insufficient evidence to reject $H_0$ Or sufficient evidence to accept $H_0$ /not significant	<b>M1</b>
$x = 3$ is not in the critical region	<b>M1</b>

