Question Number	Scheme	Marks
7(a)	$X \sim \text{B}(30,\ 0.45) \Rightarrow \text{P}(X > 16) = 1 - \text{P}(X \leqslant 16) = 1 - 0.8644$	M1
	$= 0.1356$ **awrt 0.136**	A1
		(2)
(b)	$Y \sim \text{N}(81, 44.55)$ where Y is the number of trains which arrive no more than 2 minutes late	M1A1
	$\text{P}\left(Y > \dfrac{k + 0.5 - "81"}{\sqrt{"44.55"}}\right) < 0.0427$	M1 M1 A1ft
	$\dfrac{k + 0.5 - "81"}{\sqrt{"44.55"}} > 1.72$	M1B1
	$k > 91.98... \Rightarrow k = 92$	A1
		(8)

	Notes	Total 10
(a)	**M1**	for use of a binomial with $n = 30,\ p = 0.45$ (you may need to check probabilities if no distribution is given.) (e.g. awrt 0.864, awrt 0.769, awrt 0.231, awrt 0.645, awrt 0.355)
	A1	awrt 0.136 (Correct answer scores 2/2)
(b)	**M1**	for attempting the **correct** binomial to normal approximation. Score for sight of N(81,...) o.e.
	A1	correct normal distribution N(81, 44.55)
	M1	for attempting a continuity correction (***k* + 0.5 or *k* - 0.5)**
	M1	for attempting to standardise with their "81" and their $\sqrt{"44.55"}$ or awrt 6.67, with or without a continuity correction.
	A1ft	dependent on both of the previous method marks. For a correct standardisation using ***k* + 0.5** but ft their "81" and their $\sqrt{"44.55"}$ or awrt 6.67
	M1	for setting their standardised expression more than a z-value $1 < \lvert z \rvert < 3$ (Condone equals)
	B1	correct z-value awrt 1.72 (Allow -1.72 if consistent with their standardisation)
	A1	dependent on all the previous marks for 92
	SC	if no continuity correction is used leading to 92.48027526…then maximum score is M1A1M0M1A0ftM1B1A0
	SC	if the incorrect continuity correction (k – 0.5) is used leading to 92.9802… then maximum score is M1A1M1M1A0ftM1B1A0