Question Number	Scheme	Marks
7. (a)	e.g. Equation of line through A and D is $\dfrac{y-\frac{21}{2}}{\frac{27}{2}-\frac{21}{2}}=\dfrac{x-\frac{9}{4}}{\frac{27}{4}-\frac{9}{4}}$	M1
	$-2x+3y=27$	A1
	$2x+y\geqslant 15,\ -2x+5y\geqslant 15,\ -2x+3y\leqslant 27,\ 2x+y\leqslant 27$	B1 A1 **(4)**
(b)	A: $P=2\left(\frac{9}{4}\right)+\frac{21}{2}k$, B: $P=2(5)+5k$, C: $P=2(10)+7k$, D: $P=2\left(\frac{27}{4}\right)+\frac{27}{2}k$	B1
	First possibility is that min is A and max is C $2\left(\frac{9}{2}+\frac{21}{2}k\right)\geqslant 20+7k$	M1
	$k\geqslant\frac{11}{14}$	A1
	Second possibility is that min is B and max is D $2(10+5k)\geqslant\frac{27}{2}+\frac{27}{2}k$	M1
	$k\leqslant\frac{13}{7}$	A1 **(5)**
	Special Case Candidates may consider $k<1$ and $k>1$ separately and obtain two ranges for k $\frac{11}{14}\leqslant k<1$ and $1<k\leqslant\frac{13}{7}$ scores M1 A1 M1 A0 $\frac{11}{14}\leqslant k\leqslant 1$ and $1\leqslant k\leqslant\frac{13}{7}$ scores M1 A1 M1 A1	
		9 marks

	Notes for Question 7
a1M1	Correct method for finding the equation of the line through A and D (condone a slip in values for this mark)
a1A1	Correct equation of the line through A and D (a correct 3 term equation, in any equivalent form, implies M1 A1) (may also be implied by any inequality with the correct 3 terms)
a1B1	Any two correct inequalities (condone strict inequalities)
a2A1	CAO (all four correct, accept any equivalent 3 term form or e.g. $2x+y-15\geqslant 0$)
b1B1	Correct objective applied at any of A, B, C or D
b1M1	Setting up a linear inequality using A and C – allow any inequality or equals and the 2 on the wrong side
b1A1	CAO ($k\geqslant\frac{11}{14}$)
b2M1	Setting up a linear inequality using B and D – allow any inequality or equals and the 2 on the wrong side
b2A1	CAO ($k\leqslant\frac{13}{7}$) Note we do not need to see the inequalities combined to form a single range of values. If they do combine the two correct inequalities, they must give a correct range $\frac{11}{14}\leqslant k\leqslant\frac{13}{7}$ do not ISW, remove the final A mark

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