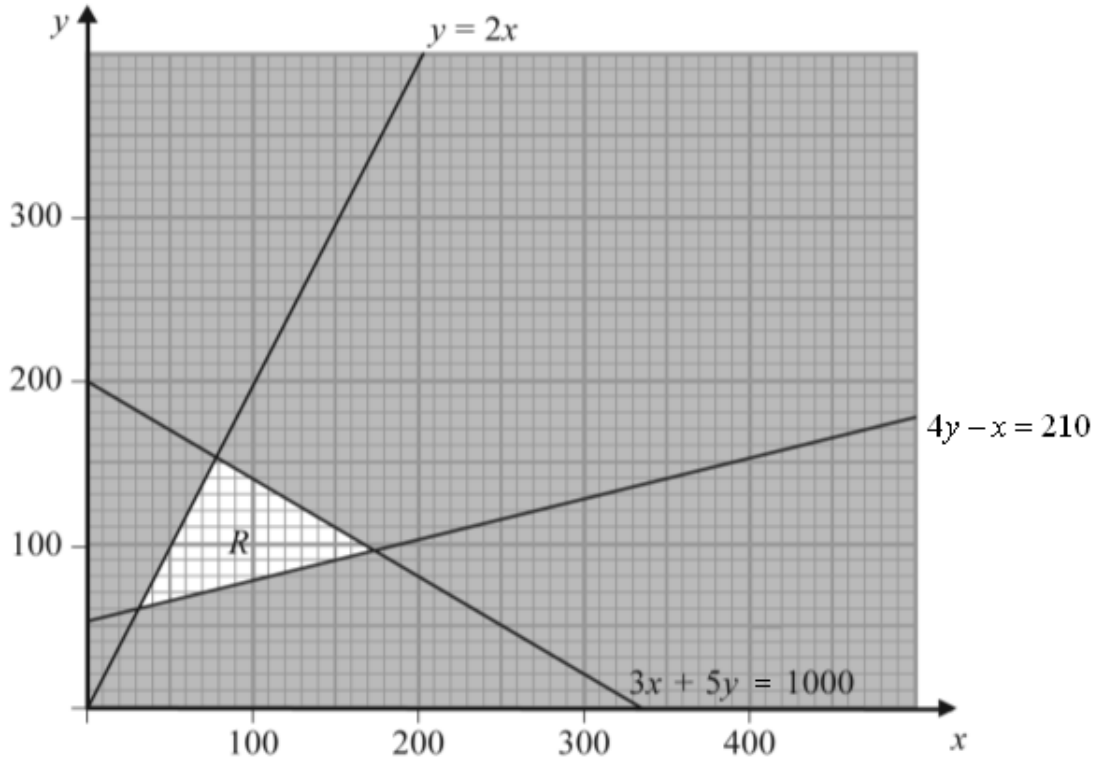
Question Number	Scheme	Marks
5. (a)	$3x + 5y \leq 1000$	B1 **(1)**
(b)		B1 B1 B1 dB1 **(4)**
(c)	Objective is to maximise (P =) x + y	B1 **(1)**
(d)	$(A=)\ (30, 60)$, $(B=)\left(76\frac{12}{13},\ 153\frac{11}{13}\right)\left(\frac{1000}{13},\ \frac{2000}{13}\right)$, $(C=)\left(173\frac{9}{17},\ 95\frac{15}{17}\right)\left(\frac{2950}{17},\ \frac{1630}{17}\right)$ At A, P = 90 At B, P = $230\frac{10}{13}\left(\frac{3000}{13}\right)$ At C, P = $269\frac{7}{17}\left(\frac{4580}{17}\right)$ So C is optimal point Testing integer solutions around C, $4y - x \geqslant 210$ | $3x + 5y \leqslant 1000$ | $(P=)\ x + y$ (173, 95) | 207 (N) | (994 (Y)) | (268) (173, 96) | 211 (Y) | 999 (Y) | 269 (174, 95) | 206 (N) | (997 (Y)) | (269) (174, 96) | (210 (Y)) | 1002 (N) | (270) $x = 173$ and $y = 96$ is optimal integer solution, so they should make 173 soft toys and 96 craft sets	dM1 A1 A1 ddM1 A1 M1 A1 **(7)**

		(13)
	Notes for Question 5	
(a)	**B1:** CAO	
(b)	**All lines should be within half a small square of the stated points and must be long enough to fully define the feasible region (if necessary the line should be extended to the stated points)** **1B1:** 3x + 5y = 1000 drawn CAO (if correct passes through (0, 200) and (300, 20)) **2B1:** y = 2x drawn CAO (if correct passes through (0, 0) and (100, 200)) **3B1:** 4y – x = 210 drawn CAO (if correct passes through (30, 60) and (150, 90))	
(c)	**4dB1:** *R* labelled with correct shading, either consistently outside the region or inside the region **(dependent on all three lines correct)**	
(d)	**B1:** maximise (accept max but not maximum) and **(P=)** $x + y$ **1dM1:** Attempt to solve two pairs of the above equations simultaneously (may be using calculator, so no working may be seen, but do not accept 3 pairs of coordinates with integer values which have been read off the graph. The correct three pairs of coordinates implies M1A1A1) **(dependent on scoring at least 2/4 in (b))** **1A1:** At least 1 correct *R* vertex found awrt 1dp (76.9, 153.8) (173.5, 95.9) **2A1:** All correct *R* vertices but must be exact values $(A=)\ (30, 60)$ $(B=)\left(76\frac{12}{13},\ 153\frac{11}{13}\right)\left(\frac{1000}{13},\ \frac{2000}{13}\right)(C=)\left(173\frac{9}{17},\ 95\frac{15}{17}\right)\left(\frac{2950}{17},\ \frac{1630}{17}\right)$ **2ddM1:** Attempt to evaluate at least 2 points in $x + y$ (may be using calculator, so no working may be seen – the correct three values implies M1A1) **(dependent on previous M mark)(condone use of integer coordinates here)** **3A1:** The 2 correct P values for B and C either exact or awrt 1 dp (230.8, 269.4) $(230\frac{10}{13}, 269\frac{7}{17})$ **3M1:** Attempt to test at least two integer points around their "C" in both inequalities or one failed inequality. (Accept a clear indication that the point has been tested against the inequalities such as a tick or cross without explicitly stating the numerical values) **4A1:** CAO – must be in context, so do **not** accept x = 173 and y = 96 or (173, 96)	