1	(i) 0 or −3/2 o.e. (ii) $k < -9/8$ o.e. www	2 3	1 each M2 for 3^2 (−)(−8k) < 0 o.e. or −9/8 found or M1 for attempted use of $b^2 - 4ac$ (may be in quadratic formula); SC: allow M1 for 9 − 8k < 0 and M1 ft for k > 9/8	 5

2	$y(x - 2) = (x + 3)$ $xy - 2y = x + 3$ or ft [ft from earlier errors if of comparable difficulty – no ft if there are no xy terms] $xy - x = 2y + 3$ or ft $[x =] \frac{2y+3}{y-1}$ o.e. or ft <u>alt method:</u> $y = 1 + \frac{5}{x-2}$ $y - 1 = \frac{5}{x-2}$ $x - 2 = \frac{5}{y-1}$ $x = 2 + \frac{5}{y-1}$	M1 M1 M1 M1 M1 M1 M1	for multiplying by $x - 2$; condone missing brackets for expanding bracket and being at stage ready to collect x terms for collecting x and 'other' terms on opposite sides of eqn for factorising and division for either method: award 4 marks only if fully correct	 4

3	$(y - 3)(y - 4)$ [= 0] $y = 3$ or 4 cao $x = \pm\sqrt{3}$ or ± 2 cao	M1 A1 B2	for factors giving two terms correct or attempt at quadratic formula or completing square or B2 (both roots needed) B1 for 2 roots correct or ft their y (condone $\sqrt{}$ 3 and $\sqrt{}$ 4 for B1)	 4

4	(i) $\sqrt{3}$ (ii) common denominat $(5 - \sqrt{2})(5 + \sqrt{2})$ =23 numerator = 10	2 M1 A1 B1	M1 for $\sqrt{48} = 4\sqrt{3}$ allow M1A1 for $\frac{5-\sqrt{2}}{23} + \frac{5+\sqrt{2}}{23}$ allow 3 only for 10/23	 5

5	$\frac{-5}{10}$ o.e.	3	M1 for $4x + 5 = 2x \times -3$ and M1 for $10x = -5$ o.e. or M1 for $2 + \frac{5}{2x} = -3$ and M1 for $\frac{5}{2x} = -5$ o.e.	 3

6	$[a =]\frac{2c}{2-f}$ or $\frac{-2c}{f-2}$ as final answer	3	M1 for attempt to collect *a*s and *c*s on different sides and M1 ft for *a* (2 − *f*) or dividing by 2 − *f*; allow M2 for $\frac{7c-5c}{2-f}$ etc	3

7	$b^2 - 4ac$ soi use of $b^2 - 4ac$ < 0 k^2 < 16 [may be implied by k < 4] −4 < k < 4 or k > −4 and k < 4 isw	M1 M1 A1 A1	may be implied by k^2 < 16 deduct one mark in qn for ≤ instead of <; allow equalities earlier if final inequalities correct; condone *b* instead of *k*; if M2 not earned, give SC2 for qn [or M1 SC1] for *k* [=] 4 and − 4 as answer]	4

8	a = ¼	2	M1 for subst of −2 or for −8 + 4*a* + 7 = 0 o.e. obtained eg by division by (*x* + 2)	2

9	n (n + 1) seen = odd × even and/or even × odd = even	M1 A1	or B1 for n odd ⇒ n^2 odd, and comment eg odd + odd = even B1 for n even⇒ n^2 even, and comment eg even + even = even allow A1 for 'any number multiplied by the consecutive number is even'	2

10	$[C =]\frac{4P}{1-P}$ or $\frac{-4P}{P-1}$ o.e.	**4**	M1 for $PC + 4P = C$ M1 for $4P = C - PC$ or ft M1 for $4P = C(1 - P)$ or ft B3 for $[C =]\frac{4}{\frac{1}{P}-1}$ o. unsimplified	4

11	(i) $k \leq 25/4$ (ii) -2.5	3 2	M2 for $5^2 - 4k \geq 0$ or B2 for 25/4 obtained isw or M1 for $b^2 - 4ac$ soi or completing square accept −20/8 or better, isw; M1 for attempt to express quadratic as $(2x + a)^2$ or for attempt at quadratic formula	5