Extended Mathematics
Topic :Algebra-1
Year :May 2013 -May 2024
Paper - 2
Answers

Question 1

[±] 3.1623 cao	**2**	**M1** for $\sqrt{10}$ seen

Question 2

$(b + d)(a + c)$	**2**	**B1** for $b(a + c) + d(a + c)$ or $a(b + d) + c\,(b + d)$

Question 3

25	**4**	**M1** for correct method to eliminate one variable **A1** for $x = 11$ **A1** for $y = 3$ **B1 FT** for $2 \times$ *their* $x +$ *their* y correctly evaluated

Question 4

$\dfrac{-7 \pm \sqrt{7^2 - 4(2)(-3)}}{2 \times 2}$	**B2**	**B1** for $\sqrt{7^2 - 4(2)(-3)}$ or better seen **B1** for $p = -7$ and $r = 2 \times 2$ or better as long as in the form $\dfrac{p + \sqrt{q}}{r}$ or $\dfrac{p - \sqrt{q}}{r}$
0.39, –3.89 cao	**B1,B1**	After **B0B0** for the two answers, **SC1** for 0.4 or 0.386[0009...] and –3.9 or –3.886[0009...] or **SC1** for −0.39 and 3.89

Question 5

14.5 oe	**3**	**M2** for complete correct method or **M1** for one correct step

Question 6

$(p + 3)(k + m)$	**2**	**B1** for $k(p + 3) + m(p + 3)$ or $p(k + m) + 3(k + m)$

Question 7

(a)	$(x + 6)(x–5)$	**2**	**SC1** for $(x + a)(x + b)$ where $ab = –30$ or $a + b$
(b)	$\frac{x+4}{x+6}$ final answer	**1**	

Question 8

$(a + b)(p – 2)$	**2**	**B1** $p(a + b) – 2(a + b)$ or $a(p – 2) + b(p – 2)$

Question 9

$3x(4y – x)$ final answer	**2**	**B1** for $3(4xy – x^2)$ or $x(12y – 3x)$

Question 10

(a) $a^2 + 2ab + b^2$	**2**	**B1** for a^2 [+] ab [+] ab [+] b^2 or better seen
(b) 22	**1**	

Question 11

5	**3**	**M2** for $(x – 5)(x – 1)$ or **M1** for evidence of a factorisation which gives the correct coefficient of x or positive prime constant term e.g. $(x – 7)(x + 1)$, $(x – 4)(x – 2)$, $(x – 3)(x – 1)$

Question 12

–8	**2**	**M1** for $2x = –16$ or $\frac{1}{2} + x = –7.5$ oe or better

Question 13

(8, 2)	**3**	**M1** for correctly eliminating one variable **A1** for $x = 8$ **A1** for $y = 2$ If 0 scored, **SC2** for correct substitution and correct evaluation to find the other value.

Question 14

(a) $(a + b)(1 + t)$	**2**	**B1** for $1(a + b) + t(a + b)$ or $a(1 + t) + b(1 + t)$
(b) $(x – 6)(x + 4)$	**2**	**SC1** for answer of $(x + a)(x + b)$ where $ab = –24$ or $a + b = –2$

Question 15

4.8 oe		2	**M1** for $5 + 19 = 3x + 2x$ oe or better or **B1** for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe

Question 16

(a)	$(3x-4)(x+2)$	2	**M1** for $(3x+a)(x+b)$ where $a + 3b = 2$ *or* $ab = -8$ if M0 then **SC1** for $3\left(x-\frac{4}{3}\right)(x+2)$
(b)	$1\frac{1}{3}, -2$	1FT	**dep** on **M1**

Question 17

$5a(3a^2 - b)$		2	**B1** for $a(15a^2 - 5b)$ or $5(3a^3 - ab)$

Question 18

$\frac{x-1}{3}$ final answer		4	**B2** for $(x-1)(x+7)$ or **SC1** for $(x+a)(x+b)$ where $ab = -7$ or $a + b = 6$ **B1** for $3(x+7)$

Question 19

(a)	$2pq(2p-3q)$	2	**B1** for $pq(4p-6q)$ or $2q(2p^2-3pq)$ or $2p(2pq-3q^2)$
(b)	$(u+4t)(1+x)$	2	**B1** for $1(u+4t)+x(u+4t)$ or $u(1+x)+4t(1+x)$

Question 20

$-\frac{3}{5}$ oe		3	**B2** for $5x + 3 = 0$ oe or **B1** for a numerator of $3(x+1)+2x[=0]$ seen

Question 21

$[x =]\ 2, [y =] -3$		2	**B1 B1** or **SC1** for reversed answers

Question 22

(a)	$(a+b)(x+y)$	**2**	**B1** for $a(x+y)+b(x+y)$ or $x(a+b)+y(a+b)$
(b)	$(x-1)(3x-2)$	**2**	**B1** for $(x-1)(3(x-1)+1)$ If **B0** then **SC1** for $(x+a)(3x+b)$ where $3a+b=-5$ or $ab=2$ or $3(x-1)(x-\frac{2}{3})$

Question 23

30	**2**	**M1** for $n-8=22$ or $\frac{n}{2}=15$

Question 24

$18\frac{1}{18}$	**2**	**M1** for $\frac{2}{36}+\frac{36}{2}$ or better

Question 25

9.5 or $\frac{19}{2}$	**3**	**M2** for $2x=(8\times 3)-5$ or better oe or **M1** for $2x+5=8\times 3$ or better

Question 26

$\frac{2x}{x+7}$ Final answer	**4**	**M1** for $4x(x-4)$ or partial factorisation of numerator and **M2** for $[2](x+7)(x-4)$ oe or **M1** for $[2](x^2+3x-28)$ or $[2](x+a)(x+b)$ where $ab=-28$ or $a+b=3$ **SC3** for answer $\frac{4x}{2x+14}$ oe

Question 27

Correctly eliminating one variable	**M1**	
$[x=]$ 6	**A1**	
$[y=]\frac{1}{4}$	**A1**	If 0 scored **SC1** for 2 values satisfying one of the original equations **SC1** if no working shown but correct answers given

Question 28

$7p(2p+3q)$	**2**	**B1** for $7(2p^2+3pq)$ or $p(14p+21q)$

Question 29

$\sqrt{1^2-4(2)(-2)}$	**B1**	If completing the square **B1** for $\left(x+\frac{1}{4}\right)^2$ oe
If in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ $p=-1,\ r=2(2)$ or 4	**B1**	**B1** for $x=-\frac{1}{4}+\sqrt{1+\left(\frac{1}{4}\right)^2}$ or $x=-\frac{1}{4}-\sqrt{1+\left(\frac{1}{4}\right)^2}$
-1.28 0.78	**B1** **B1**	If **0** scored for the last two **B** marks then **SC1** for -1.3 **and** 0.8 or -1.281 to -1.280 **and** 0.781 or 0.7807 to 0.7808 or 1.28 **and** -0.78 or -1.28 **and** 0.78 seen in the working

Question 30

2.8 oe	**3**	**M2** for $12+2=8x-3x$ or better or **M1** for $3x+12$ or $8x-2$

Question 31

$(2x+1)(x-3)$	**2**	**B1** for $(2x+a)(x+b)$, where $ab=-3$ or $a+2b=-5$

Question 32

$3x(3x-2)$ final answer	**2**	**B1** for $3(3x^2-2x)$ or $x(9x-6)$

Question 33

(a)	$m = 2$ $n = -10$	**2**	**B1** for $m = 2$ **B1** for $n = -10$ If 0 scored **SC1** for $(x + 2)^2$ in working or $x^2 + 2mx + m^2 + n$ and equating coefficients $2m[x] = 4[x]$ or $m^2 + n = -6$
(b)	**1.16** or 1.16[2…] from completing square	**2FT**	**FT** dep on negative n **B1** for $(x + \textit{their } m)^2 = -\textit{their } n$ or **SC1** for correct answer from using formula or for both answers 1.16 **and** –5.16 whatever method used

Question 34

(a)	$(p+t)(y+2x)$ final answer	**2**	**B1** for $y(p+t)+2x(p+t)$ or $p(y+2x)+t(y+2x)$
(b)	$7(h+k)(h+k-3)$ final answer	**2**	**B1** for $7\left((h+k)^2-3(h+k)\right)$ or $(h+k)(7(h+k)-21)$

Question 35

Correctly equating one set of coefficients	**M1**	
Correct method to eliminate one variable	**M1**	Dependent on the coefficients being the same for one of the variables Correct consistent use of addition or subtraction using their equations
$x = 0.8$	**A1**	If zero scored **SC1** for 2 values satisfying one of the original equations or if no working shown, but 2 correct answers given
$y = -3$	**A1**	

Question 36

$24u^2w^3$ final answer	**2**	**B1** for 2 correct elements in final answer

Question 37

$2x^2 + 8x - 35$ final answer	**2**	**B1** for 2 correct terms in final answer or **M1** for $2x^2 + 3x$ or $5x - 35$

Question 38

$\frac{1}{2-5w}$ final answer nfww	**4**	**B1** for $2(2 + 5w)$ **B1** for $2(4 - 25w^2)$ **B1** for $[2](2 + 5w)(2 - 5w)$ ALT method **B3** for $\frac{4+10w}{(4+10w)(2-5w)}$ or **B2** for $(4 + 10w)(2 - 5w)$

Question 39

$\sqrt{(4)^2 - 4(3)(-5)}$ or better seen	**B1**	If completing the square
if $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ seen then		**B1** for $\left(x + \frac{2}{3}\right)^2$ oe
$p = -4$ and $r = 2(3)$	**B1**	**B1** for $-\frac{2}{3} + \sqrt{\frac{5}{3} + \frac{2^2}{3^2}}$ or $-\frac{2}{3} - \sqrt{\frac{5}{3} + \frac{2^2}{3^2}}$
-2.12	**B1**	
0.79 final answers	**B1**	If B0, **SC1** for 0.786[299] **and** −2.119[632] -2.1 **and** 0.8 or -2.120 or -2.119 **and** 0.786 or 2.12 and –0.79 final answers –2.12 **and** 0.79 seen not as final answers

Question 40

$5 - u$ final answer	**2**	**B1** for $5 + ku$ or $j - u$, $k \neq 0$ as final answer

Question 41

$2x(1 - 2x)$ final answer	**2**	**B1** for $2(x - 2x^2)$ or $x(2 - 4x)$ as final answer

Question 42

$\sqrt{(-6)^2 - 4(5)(-3)}$ or better seen	**B1**	If completing the square **B1** for $\left(x - \frac{3}{5}\right)^2$ oe
if $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ seen then $p = -(-6)$ and $r = 2 \times 5$	**B1**	**B1** for $\frac{3}{5} + \sqrt{\frac{3}{5} + \left(\frac{3}{5}\right)^2}$ or $\frac{3}{5} - \sqrt{\frac{3}{5} + \left(\frac{3}{5}\right)^2}$ oe
-0.38 1.58 cao final answers	**B1** **B1**	If B0, **SC1** for -0.4 and 1.6 or $-0.379[795..]$ and $1.579[795..]$ or -1.58 and 0.38 as final answers or -0.38 and 1.58 seen in working

Question 43

(a)	$(3w+10)(3w-10)$ final answer	**1**	
(b)	$(m+n)(p-6q)$ oe final answer	**2**	**B1** for $p(m+n)-6q(m+n)$ oe or $m(p-6q)+n(p-6q)$ oe

Question 44

$\frac{x+4}{x+1}$ final answer	**4**	**B1** for $(x-4)(x+4)$ and **B2** for $(x-4)(x+1)$ or **SC1** for $(x+a)(x+b)$ where $a+b=-3$ or $ab=-4$

Question 45

(a)	$(a+3c)(x+y)$ final answer	**2**	**B1** for $a(x+y)+3c(x+y)$ or $x(a+3c)+y(a+3c)$
(b)	$3(a-2b)(a+2b)$ final answer	**3**	**B2** for $3(a-2b)(a+2b)$ seen and then spoiled or $(3a-6b)(a+2b)$ or $(a-2b)(3a+6b)$ or $(a-2b)(a+2b)$ or **B1** for $3(a^2-4b^2)$

Question 46

$\frac{-(-11)\pm\sqrt{(-11)^2-4(3)(4)}}{2\times 3}$	**2**	**B1** for $\sqrt{(-11)^2-4(3)(4)}$ or better and, if in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$, **B1** for $p=-(-11)$ and $r=2(3)$
0.41 and 3.26 final ans cao	**B1B1**	**SC1** for 0.4 and 3.3 or 0.409... and 3.257... or -0.41 and -3.26 or 0.41 and 3.26 seen in working

Question 47

$2x(1-2y)$ final answer	**2**	**M1** for $2(x-2xy)$ or $x(2-4y)$ or for correct answer then spoilt

Question 48

$7, -4$	**1**	

Question 49

0.5 or $\frac{1}{2}$	**2**	**M1** for correct first step e.g. $6y+6=9$ or $y+1=\frac{9}{6}$

Question 50

Correctly eliminating one variable	**M1**	If zero scored **SC1** for 2 values satisfying one of the original equations or if no working shown, but 2 correct answers given
$x=4$	**A1**	
$y=0.5$ oe	**A1**	

Question 51

$a=3.5$ or $\frac{7}{2}$ **and** $b=-17.25$ or $-\frac{69}{4}$	**3**	**B2** for one correct or **M2** for $(x+\frac{7}{2})^2-5-\left(\frac{7}{2}\right)^2$ or **M1** for $(x+\frac{7}{2})^2$ oe or $2a=7$ or $a^2+b=-5$ after $x^2+2ax+a^2$

Question 52

(a)	$(a+2)(2+p)$ final answer	**2**	**B1** for $2(a+2)+p(a+2)$ or $a(2+p)+2(2+p)$
(b)	$2(9+2t)(9-2t)$ oe	**2**	**B1** for $2(81-4t^2)$ oe or $(18+4t)(9-2t)$ oe If 0 scored **SC1** for $(9+2t)(9-2t)$ final answer

Question 53

11	**2**	**M1** for $-2\times-7-3$ soi

Question 54

$\frac{7n}{2t+3m}$ final answer	**4**	**M1** for $7n(6p-1)$ seen and **M2** for $(2t+3m)(6p-1)$ seen or **M1** for $2t(6p-1)+3m(6p-1)$ or $6p(2t+3m)-1(2t+3m)$

Question 55

36	**1**	

Question 56

(a)	$m(m^2+1)$ final answer	**1**	
(b)	$(5-y)(5+y)$ final answer	**1**	
(c)	$(x-4)(x+7)$ final answer	**2**	**B1** for $(x-4)(x+7)$ seen then spoiled or **M1** for $(x+a)(x+b)$ where $ab=-28$ or $a+b=3$ or for $x(x+7)-4(x+7)$ or $x(x-4)+7(x-4)$

Question 57

correctly eliminating one variable	**M1**	
$[x=]$ 9	**A1**	
$[y=]$ 3.5	**A1**	If zero scored, **SC1** for 2 values satisfying one of the original equations **SC1** if no working shown but 2 correct answers given

Question 58

21	**2**	**M1** for $k-8=13$ or $6k-48=78$ or better

Question 59

$\sqrt{(3)^2-4(2)(-3)}$ oe or better	**B1**	If completing the square, **B1** for $\left(x+\frac{3}{4}\right)^2$ oe
$\frac{-3+\sqrt{k}}{2(2)}$ or $\frac{-3-\sqrt{k}}{2(2)}$ oe	**B1**	**B1** for $-\frac{3}{4}+\sqrt{\frac{3}{2}+\left(\frac{3}{4}\right)^2}$ or $-\frac{3}{4}-\sqrt{\frac{3}{2}+\left(\frac{3}{4}\right)^2}$ oe
–2.19, 0.69	**B1B1**	**SC1** for –2.2 or –2.186… **and** 0.7 or 0.686.. or –2.19 **and** 0.69 seen but not final answer or 2.19 **and** –0.69

Question 60

(a)	$(2p-3)(2p+3)$ final answer	**1**	
(b)	$(a-2b)(2x-y)$ oe final answer	**2**	**B1** for $2x(a-2b)-y(a-2b)$ or $a(2x-y)-2b(2x-y)$

Question 61

Correctly eliminating one variable	**M1**	
$[x=]-1$ and	**A1**	If zero scored, **SC1** for 2 values that satisfy one of the original equations **or** **SC1** if no working shown, but 2 correct answers given
$[y=]5$	**A1**	

Question 62

$\frac{x^2+2y^2}{xy}$ or $\frac{x}{y}+\frac{2y}{x}$ final answer	**2**	**B1** for $xy(x^2+2y^2)$ or **M1** for $\frac{x^2y+2y^3}{xy^2}$ or $\frac{x^3+2xy^2}{x^2y}$

Question 63

(a)	$5c(3c-1)$ final answer	**2**	**B1** for $5\left(3c^2-c\right)$ or $c(15c-5)$
(b)	$(2p-m)(k+3)$ final answer	**2**	**B1** for $k(2p-m)+3(2p-m)$ or $2p(k+3)-m(k+3)$

Question 64

150	**2**	**M1** for $2\times3+16\times3^2$

Question 65

$18w+14$ final answer	**2**	**M1** for $20w+12$ or $-2w+2$ or answer $18w+k$ or $kw+14$

Question 66

(a)	$4(x-6)$ or $4x-24$ as final answer	**1**	
(b)	$x^2+23x+26$ final answer	**3**	**B2** for $x^2+4x+4x+16$ or better or **B1** for $15x+10$

Question 67

$\sqrt{10^2-4\times5\times2}$ oe or better	**B1**	If completing the square: **B1** for $(x+1)^2$ oe **B1** for $-1+\sqrt{1-\frac{2}{5}}$ or $-1-\sqrt{1-\frac{2}{5}}$ oe
$\frac{-10+\sqrt{q}}{2(5)}$ or $\frac{-10-\sqrt{q}}{2(5)}$ oe	**B1**	
– 0.23, –1.77 final ans cao	**B1B1**	**SC1** for – 0.2 or – 0.225... **and** –1.8 or –1.774... or –1.775 or 0.23 and 1.77 as answer or – 0.23 and –1.77 seen in working Maximum score without working is 2

Question 68

$4x(x-2y)$ final answer	**2**	**M1** for $4(x^2-2xy)$ or $x(4x-8y)$ or $2(2x^2-4xy)$ or $2x\,(2x-4y)$

Question 69

(a)	$(3t+u)(3t-u)$ final answer	**2**	**B1** for $(at+bu)(ct+du)$ final answer where $ac=9$ or $ad+bc=0$ or $bd=-1$
(b)	$(c-2d)(2-p)$ or $(p-2)(2d-c)$ final answer	**2**	**M1** for $2(c-2d)-p(c-2d)$ or $c(2-p)-2d(2-p)$ or $p(2d-c)-2(2d-c)$ or $2d(p-2)-c(p-2)$

Question 70

$\frac{1}{6}$ oe	**2**	**M1** for $2-1=5x+x$ oe

Question 71

41	**2**	**M1** for $5(7) - 3(-2)$

Question 72

$7(2x - 3y)$ final answer	**1**	

Question 73

$4n(3n - m)$ final answer	**2**	**B1** for $4(3n^2 - mn)$ or $n(12n - 4m)$ or $2n(6n - 2m)$ or $2(6n^2 - 2mn)$

Question 74

(a)	$(x-12)(x+11)$ final answer	**2**	**B1** for $(x+a)(x+b)$ where $ab = -132$ or $a + b = -1$
(b)	$x(x+2)(x-2)$ final answer	**2**	**B1** for $x(x^2 - 4)$ or $(x+2)(x^2 - 2x)$ or $(x-2)(x^2 + 2x)$

Question 75

(a)	$\frac{5}{14}$ or 0.357 or 0.357…	**2**	**M1** for $7 - 2 = 11n + 3n$ oe or better
(b)	18	**2**	**M1** for $p - 3 = 3 \times 5$ or $\frac{p}{5} = 3 + \frac{3}{5}$

Question 76

Correctly eliminating one variable	**M1**	
$[x =] \frac{2}{3}$ or 0.667 or 0.6666…	**A1**	
$[y =] \frac{1}{3}$ or 0.333 or 0.333…	**A1**	If zero scored, **SC1** for 2 values satisfying one of the original equations or if no working shown but 2 correct answers given

Question 77

$15 + 2n - n^2$ final answer	**2**	**M1** for three terms of $15 + 5n - 3n - n^2$ correct

Question 78

$3x(4x + 5y - 3)$ final answer	**2**	**B1** for $3(4x^2 + 5xy - 3x)$ or $x(12x + 15y - 9)$ allow in working or correct answer spoiled If zero scored, **SC1** for $3x(4x + 5y - 3)$ with only 2 correct elements in the brackets, allow in working

Question 79

$\frac{-7 \pm \sqrt{(7)^2 - 4(2)(-3)}}{2 \times 2}$	**B2**	**B1** for $\sqrt{(7)^2 - 4(2)(-3)}$ or better **B1** for $p = -7$ and $r = 2 \times 2$ if in form $\frac{p + \sqrt{q}}{r}$ or $\frac{p - \sqrt{q}}{r}$ Completing the square method: **B1** for $(x + 1.75)^2$ oe **B1** for $-1.75 \pm \sqrt{1.5 + 1.75^2}$ oe
0.39 and – 3.89 final ans cao	**B2**	**B1** for each If **B0**, **SC1** for 0.4 and – 3.9 or 0.386...and – 3.886... or 0.39 and – 3.89 seen in working or – 0.39 and 3.89

Question 80

correctly eliminating one variable	**M1**	
$[x =] 7$ $[y =] -2$	**A2**	**A1** for each If **M0** scored **SC1** for 2 values satisfying one of the original equations or **SC1** if no working shown, but 2 correct answers given

Question 81

$5m(3k^2 - 4m^3)$ final answer	**2**	**B1** for $5(3k^2m - 4m^4)$ or $m(15k^2 - 20m^3)$ or for $5m(3k^2 - 4m^3)$ with one error in a number

Question 82

$6p^2 + 5p - 6$ final answer	**3**	**B2** for $6p^2 + 9p - 4p - 6$ or **B1** for three correct terms

Question 83

$\frac{1}{3-x}$ nfww final answer	**2**	**B1** for $(3-x)(3+x)$ or $-(x-3)(x+3)$

Question 84

$(a+2b)(2-x)$ final answer	**2**	**M1** for $2(a+2b)-x(a+2b)$ or $a(2-x)+2b(2-x)$ or $-a(x-2)-2b(x-2)$

Question 85

-11	**2**	**M1** for $1-p=3\times4$ or better or $-\frac{p}{3}=4-\frac{1}{3}$ or better

Question 86

$w(1+w^2)$ final answer	**1**	

Question 87

$(x+2)(y+3)$ final answer	**2**	**B1** for $y(x+2)+3(x+2)$ or $x(y+3)+2(y+3)$

Question 87

$[a=]$ 15 $[b=]$ –27	**2**	**B1** for each or **SC1** for reversed answers

Question 89

$7x-56$ final answer	**1**	

Question 90

$7y-23$ final answer	**2**	**M1** for $12y-18$ or $-5y-5$ or **B1** for answer $7y-k$ or $cy-23$ $c\neq0$

Question 91

66	**2**	**B1** for 84 or –18 seen

Question 92

(a)	$(x+y)(p-1)$ final answer	**2**	**M1** for $p(x+y)-(x+y)$ or $x(p-1)+y(p-1)$
(b)	$2(t+7m)(t-7m)$ final answer	**3**	**M2** for $(2t+14m)(t-7m)$ or $(t+7m)(2t-14m)$ or correct answer seen or **M1** for $2(t^2-49m^2)$ or $(t+7m)(t-7m)$ or $2(t+7)(t-7)$

Question 93

$\frac{x-1}{x}$ or $1-\frac{1}{x}$ nfww final answer	**4**	**B1** for $x(2x+1)$ **B2** for $(2x+1)(x-1)$ or **B1** for $2x(x-1)+[1](x-1)$ or $x(2x+1)-[1](2x+1)$ or $(2x+a)(x+b)$ where $ab=-1$ or $a+2b=-1$

Question 94

$\frac{-(-2)\pm\sqrt{(-2)^2-4(3)(-2)}}{2(3)}$ oe	**B2**	**B1** for $\sqrt{(-2)^2-4(3)(-2)}$ or better or **B1** for $\frac{-(-2)+\sqrt{q}}{2(3)}$ or $\frac{-(-2)-\sqrt{q}}{2(3)}$
–0.55, 1.22	**B2**	**B1** for each If zero scored, **SC1** for – 0.6 and 1.2 or –0.549 or –0.548… and 1.215… or 0.55 and −1.22 or –0.55 and 1.22 seen in working

Question 95

13	**2**	**M1** for $3w=32+7$ or $w-\frac{7}{3}=\frac{32}{3}$ or better

Question 96

$-3p-4q$ final answer	**2**	**B1** for $-3p$ or $-4q$

Question 97

$y(1-2y)$ final answer	**1**	

Question 98

$(a =)\ 36$ $(b =)\ -6$	**3**	**B2** for $a = 36$ or **M1** for $b = -6$ or $x^2 + bx + bx + b^2$ or better or $b^2 = a$

Question 99

$(x + 5)(y + 2)$ final answer	**2**	**B1** for $y(x + 5) + 2(x + 5)$ or $x(y + 2) + 5(y + 2)$

Question 100

$6x - 2x^3$ final answer	**2**	**B1** for $6x$ or $-2x^3$

Question 101

$\dfrac{-7 \pm \sqrt{(7)^2 - 4(3)(-11)}}{2 \times 3}$	**B2**	**B1** for $\sqrt{(7)^2 - 4(3(-11))}$ or better and **B1** for $\dfrac{-7 + \sqrt{q}}{2(3)}$ or $\dfrac{-7 - \sqrt{q}}{2(3)}$
-3.41 and 1.08 cao	**B2**	**B1** for each If **B0**, **SC1** for -3.4 and 1.1 or -3.409 and 1.076 or $-3.4089...$ and $1.0756....$ or 3.41 and -1.08 or -3.41 and 1.08 seen in working

Question 102

for correctly equating one set of coefficients	**M1**	
for correct method to eliminate one variable	**M1**	
$[x =]\ 6$ $[y =]\ -8$	**A2**	**A1** for each If **M0** scored, **SC1** for 2 values satisfying one of the original equations **or** if no working shown, but 2 correct answers given

Question 103

$6x^2 + 13x - 63$ final answer	**2**	**M1** for 3 correct terms of $6x^2 - 14x + 27x - 63$

Question 104

$\frac{b}{a+b}$ final answer	3	**B1** for $b(a-b)$ **B1** for $(a+b)(a-b)$

Question 105

(a)	$k(7k-15)$ final answer	1	
(b)	$4(m+p)(3+2m+2p)$ final answer	2	**B1** for $(m+p)(12+8(m+p))$ or $(m+p)(12+8m+8p)$ or $(4m+4p)(3+2m+2p)$ or $(2m+2p)(6+4m+4p)$ or $2(2m+2p)(3+2m+2p)$ or $2(m+p)(6+4m+4p)$

Question 106

$\frac{x^2}{x-5}$ final answer	3	**B1** for $x^2(x+5)$ **B1** for $(x-5)(x+5)$

Question 107

(a)	3	2	**M1** for $a \times 7^2 + a = 150$ oe
(b)	-7	1	

Question 108

$[w=]\ \frac{P}{2} - h$ or $\frac{P-2h}{2}$ final answer	2	**M1** for $w+h=\frac{P}{2}$ or $2w+2h=P$

Question 109

$x(2x-1)$	1	

Question 110

$\frac{-(-2)\pm\sqrt{(-2)^2-4(3)(-10)}}{2\times3}$	**B2**	**B1** for $\sqrt{(-2)^2-4(3)(-10)}$ or better and if in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ then **B1** for $p = -(-2)$ and $r = 2(3)$
–1.52 and 2.19 final ans cao	**B1B1**	If B0B0, **SC1** for –1.5 and 2.2 or –1.523 to –1.522... and 2.189.... or 1.52 and –2.19 or –1.52 and 2.19 seen in working

Question 111

Correctly eliminating one variable	**M1**	
$[x =] -4$ $[y =] 3$	**A2**	**A1** for one correct If **M0** scored, **SC1** for 2 values satisfying one of the original equations

Question 112

2	**2**	**M1** for $9f - 3f$ oe or $23 - 11$ oe

Question 113

(a)	$(p-q)(p+q)$ final answer	**1**	
(b)	$\frac{7}{2}$ oe	**2**	**M1** for $2 \times (p+q) = 7$ or for $(2+q)^2 - q^2 = 7$ or $p^2 - (p-2)^2 = 7$

Question 114

$3x^2 - 3x + 2$ final answer	**3**	**B2** for $x^2 + 2x + x + 2 + 2x^2 - 6x$ oe or **B1** for 3 correct terms of $x^2 + 2x + x + 2$ oe

Question 115

$[a =]\ 2$ $[b =] - 13$	**3**	**B2** for either correct or $(x + 2)^2 - 13$ OR **M1** for $2a = 4$ soi **M1** for $a^2 + b = -9$ soi OR **M1** for $x^2 + ax + ax + a^2$ [$+b$] or better

Question 116

$y(5 - 6p)$ final answer	**1**	

Question 117

(a)	$3(4x + 5)$ final answer	**1**	
(b)	$(x + 3)(y - 2)$ final answer	**2**	**B1** for $y(x + 3) - 2(x + 3)$ or $x(y - 2) + 3(y - 2)$ or correct answer seen then spoilt

Question 118

$x^2 + 8x + 15$ final answer	**2**	**M1** for three terms correct from $x^2 + 3x + 5x + 15$

Question 119

(a)	$(3y + 2x)(6 - a)$ oe final answer	**2**	**M1** for $3y\ (6 - a) + 2x(6 - a)$ oe or $6(2x + 3y) - a(2x + 3y)$ oe
(b)	$3(x + 4y)(x - 4y)$ final answer	**3**	**M2** for $(3x + 12y)(x - 4y)$ or $(3x - 12y)(x + 4y)$ or **M1** for $3(x^2 - 16y^2)$ or for $(x + 4y)(x - 4y)$

Question 120

$a^4 + 3a$ final answer	**1**	

Question 121

11	**2**	**M1** for $x - 2 = 3 \times 3$ oe or $\frac{x}{3} = 3 + \frac{2}{3}$ oe or better

Question 122

$3c - 4d$ final answer	**2**	**B1** for $3c + kd$ or $kc - 4d$

Question 123

$p(5 + t)$ final answer	**1**	

Question 124

$[a =]\ 36$ $[b =]\ -6$	**2**	**B1** for each or **SC1** for correct answers reversed

Question 125

$8y^2 - 42y + 10[= 0]$ or $8x^2 + 14x - 400[= 0]$	**M3**	**M1** for $(7 - 3y)^2 - y^2 = 39$ oe or $x^2 - \left(\frac{7-x}{3}\right)^2 = 39$ oe **M1** for $49 - 21y - 21y + 9y^2$ or better or $49 - 7x - 7x + x^2$ or better or for correct expansion of their quadratic binomial
$(8y - 2)(y - 5)[= 0]$ oe $(8x - 50)(x + 8)[= 0]$ oe	**M1**	**M1** for correct method to solve *their* quadratic equation e.g. factors, quadratic formula, completing the square
$x = 6.25$ oe $y = 0.25$ oe $x = -8$ $y = 5$	**B2**	**B1** for $x = 6.25$, $x = -8$ or for $y = 0.25$, $y = 5$ or for a correct pair of x and y values

Question 126

(a)	$3x(x - 4y)$ final answer	**2**	**B1** for $3(x^2 - 4xy)$ or $x(3x - 12y)$
(b)	$m^2 - m - 6$ final answer	**2**	**M1** for 3 terms from $m^2, -3m, +2m, -6$

Question 127

(a)	$(x - 9)^2 - 108$	**2**	**B1** for $(x + h)^2 - 108$ or $(x - 9)^2 + h$ or $k = -9$
(b)	19.4 or 19.39… -1.39 or -1.392…	**2**	**M1FT** $x - \textit{their}9 = \pm\sqrt{\textit{their}108}$ **A1** for $9 \pm \sqrt{108}$ or $9 \pm 6\sqrt{3}$

Question 128

$x + y < 4$ $y \geqslant 1.5$ $y \leqslant 2x + 1$	**4**	**B3** for any two correct or **B1** for $y \geqslant 1.5$ **B2** for $x + y < 4$ or $y \leqslant 2x + 1$ or $x + y = 4$ and $y = 2x + 1$ or with incorrect inequality signs or **B1** for $x + y = 4$ or $y = 2x + 1$ or **SC3** for $>$ instead of $\geqslant$ etc.

Question 129

$\frac{2x-5}{a-2b}$ final answer	**5**	**B2** for $(2x - 5)(x + 3)$ or **B1** for $(2x + p)(x + q)$ where $pq = -15$ or $p + 2q = 1$ **B2** for $(x + 3)(a - 2b)$ or **B1** for $x(a - 2b) + 3(a - 2b)$ or $a(x + 3) - 2b(x + 3)$

Question 130

-14	**2**	**M1** for $1 - x = 3 \times 5$ or better or $\frac{x}{3} = 5 - \frac{1}{3}$ or better

Question 131

$\frac{2p^2}{t}$	**2**	**B1** for correct unsimplified answer

Question 132

-2	**2**	**M1** for $(-3)(-2) + (-8)$

Question 133

$3x^3 - 7x^2 - 43x + 15$	**3**	**B2** for correct expansion and simplification of two of the brackets or **B1** for correct expansion of two brackets with at least 3 terms correct

Question 134

$[y =]\ 5x - 4$	**1**	

Question 135

(a)	$7a(3a + 4b)$ final answer	**2**	**B1** for partial factorisation $7(3a^2 + 4ab)$ or $a(21a + 28b)$
(b)	$5(2x + 3y)(2x - 3y)$ final answer	**3**	**B2** for $(2x + 3y)(2x - 3y)$ or $(10x + 15y)(2x - 3y)$ or $(2x + 3y)(10x - 15y)$ or **B1** for $5(4x^2 - 9y^2)$

Question 136

$\frac{x+5}{x-12}$ nfww final answer	**4**	**B1** for $(x + 5)(x - 5)$ **B2** for $(x - 12)(x - 5)$ or **B1** for $x(x - 5) - 12(x - 5)$ or $x(x - 12) - 5(x - 12)$ or for $(x + a)(x + b)$ where $ab = -60$ or $a + b = -17$

Question 137

$(3x + 8y)(1 - 2a)$	**2**	**M1** for $3x(1 - 2a) + 8y(1 - 2a)$ or $3x + 8y - 2a(3x + 8y)$ or better

Question 138

$[x =]\ y(m - 2p)^2$ nfww or $[x =]\ y(m^2 - 4mp + 4p^2)$ final answer	**3**	**M1** for subtract $2p$ or *their* term in p to isolate a term in x **M1** for squaring **M1** for multiplying by *their* term in y Maximum of 2 marks for an incorrect answer

Question 139

Correctly eliminates one variable	**M1**	
$[x =]\ 6$ $[y =]\ -0.5$ oe	**A2**	**A1** for either correct If M0 scored, **SC1** for 2 values satisfying one of the original equations

Question 140

$\frac{x-2}{u+1}$ oe final answer	**4**	**B2** for $(x-2)(u-1)$ or **B1** for $u(x-2)-(x-2)$ or $x(u-1)-2(u-1)$ **B1** for $(u-1)(u+1)$

Question 141

$\frac{3}{x+1}$ final answer	**3**	**B1** for $2(x+1)-(2x-1)$ oe **B1** for common denominator $x + 1$

Question 142

$[x =]\ 3$ $[y =]\ 1$	**2**	**B1** for each

Question 143

$4(1 - 2x)$	**1**	

Question 144

1.2 or $1\frac{1}{5}$ or $\frac{6}{5}$	**2**	**M1** for $6 = 2x + 3x$ or better

Question 145

$\frac{x}{2(x+5)}$ or $\frac{x}{2x+10}$ final answer	**4**	**B1** for $x(x - 5)$ **B2** for $2(x - 5)(x + 5)$ or $(x - 5)(2x + 10)$ or $(2x - 10)(x + 5)$ or **B1** for $2(x^2 - 25)$ or $(x - 5)(x + 5)$

Question 146

$(3x - 4)(2x + 5)$ final answer	**2**	**B1** for $(ax + b)(cx + d)$ where $ac = 6$ and $ad + bc = 7$ or $bd = -20$

Question 147

$[x =]\frac{2y+7}{5}$ oe or $[x =]\frac{2y}{5}+\frac{7}{5}$ oe final answer	**2**	**M1** for $2y+7=5x$ oe or $\frac{2y}{5}=x-\frac{7}{5}$ oe

Question 148

$-a + 8b$ final answer	**2**	**B1** for $-a$ or $[+]8b$ in final answer or for $-a + 8b$ spoilt

Question 149

$x^2 + x - 156$ [=0] or $y^2 + 15y - 100$ [=0]	**M2**	**M1** for $x^2 + x = 7 + 149$ or correct substitution
$(x-12)(x+13)$ [=0] or $(y-5)(y+20)$ [=0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula or completing the square for *their* equation
$[x =]$ 12 $[y =]$ 5 $[x =] -13$ $[y =] -20$	**B2**	**B1** for $x = 12$, $x = -13$ or for $y = 5$, $y = -20$ or for a correct pair of x and y values If B0 scored and at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $x - y = 7$ or $x^2 + y = 149$

$x^2 + x - 156$ [=0] or $y^2 + 15y - 100$ [=0]	**M2**	**M1** for $x^2 + x = 7 + 149$ or correct substitution
$(x-12)(x+13)$ [=0] or $(y-5)(y+20)$ [=0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula or completing the square for *their* equation
[x =] 12 [y =] 5 [x =] –13 [y =] –20	**B2**	**B1** for $x = 12$, $x = -13$ or for $y = 5$, $y = -20$ or for a correct pair of x and y values If B0 scored and at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $x - y = 7$ or $x^2 + y = 149$

Question 150

$4t$ final answer	**2**	**B1** for $6t - 6q$ or $-2t + 6q$ or $2t - 6q$ or for $4t$ or $0q$ in the final answer

Question 151

$x = 3$, $x = -3$ nfww	**5**	**M2** for $x + 9 + 9(x + 1) = (x + 1)(x + 9)$ oe or better or **M1** for $x + 9 + 9(x + 1)$ or $(x + 1)(x + 9)$ oe or better **B1** for $x^2 + x + 9x + 9$ seen **M1 dep** for $[0 =] x^2 - 9$ oe simplified or better

Question 152

$\frac{2x+3}{3x}$ final answer	**4**	**B2** for $(x-4)(2x+3)$ or **B1** for $(x + a)(2x + b)$ where $ab = -12$ or $2a + b = -5$ or $x(2x+3) - 4(2x+3)$ or $2x(x-4) + 3(x-4)$ **B1** for $3x(x-4)$

Question 153

$2x^3 + 7x^2 - 7x - 30$ final answer	**3**	**B2** for unsimplified expansion with at most one error or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two brackets with at least three terms out of four correct

Question 154

[±] 7.5 oe	**2**	**M1** for $5.625 = \frac{b^2}{2\times 5}$ or better

Question 155

$\frac{g}{2m+g}$ final answer	**4**	**M1** for expanding brackets or $\div g$ **M1** for isolating terms in h **M1** for factorising **M1** for dividing by bracket to isolate h Incorrect/unsimplified final answer scores max 3 marks

Question 156

correctly eliminating 1 variable	**M1**	
$x = 5$	**A1**	
$y = -7$	**A1**	If M0 scored **SC1** for two values satisfying one of the original equations

Question 157

$\frac{3x}{a+2c}$ final answer	**4**	**B1** for $3x(x-6)$ **B2** for $(x-6)(a+2c)$ or **B1** for $a(x-6)+2c(x-6)$ or $x(a+2c)-6(a+2c)$

Question 158

$x^2 - 4x - 12$ [= 0] or $y^2 - 2y - 15$ [= 0]	**M2**	**M1** for $x^2 - 3x - 13 = x - 1$ or for $y = (y + 1)^2 - 3(y + 1) - 13$
$(x - 6)(x + 2)$ [= 0] or $(y - 5)(y + 3)$ [= 0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula or completing the square for *their* equation
[x =] 6, [y =] 5 [x =] –2, [y =] –3	**B2**	**B1** for one correct pair or two correct x values or two correct y values If **B0** scored **and** at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $y = x^2 - 3x - 13$ or $y = x - 1$

Question 159

(a)	2925	**2**	**M1** for $100(3^2 + 4.5^2)$ or **B1** for 29.25 seen
(b)	[±] $\sqrt{\frac{P}{M} - h^2}$ or [±] $\sqrt{\frac{P - Mh^2}{M}}$ final answer	**3**	**M1** for correct division by M **M1** for correct re-arrangement to isolate g or g^2 **M1** for correct square root of two term expression Max **2** marks for an incorrect answer

Question 160

$\frac{3y - 5}{2(x - 12)}$ or $\frac{3y - 5}{2x - 24}$ final answer	**4**	**SC3** for answer $\frac{3y - 5}{x - 12}$ or **B3** for $(3y - 5)(x + 12)$ **and** $2(x - 12)(x + 12)$ or $(2x - 24)(x + 12)$ or **B2** for $(3y - 5)(x + 12)$ or $2(x - 12)(x + 12)$ or $(2x - 24)(x + 12)$ or $(2x + 24)(x - 12)$ or **B1** for $3y(x + 12) - 5(x + 12)$ or $x(3y - 5) + 12(3y - 5)$ or $2(x^2 - 144)$ or $(x - 12)(x + 12)$

Question 161

$2x^3 - 7x^2 - 12x + 45$ final answer	**3**	**B2** for unsimplified expansion of the three brackets with at most one error

Question 162

$x^2 - 11x + 24$ [= 0] or $y^2 - 16y + 39$ [= 0]	**M2**	**M1** for $x^2 - 9x + 21 = 2x - 3$ oe or $y = \left(\frac{y+3}{2}\right)^2 - 9\left(\frac{y+3}{2}\right) + 21$ oe
$(x - 8)(x - 3)$ [= 0] or $(y - 13)(y - 3)$ [= 0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula for *their* equation
[x =] 3 [y =] 3 [x =] 8 [y =] 13	**B2**	**B1** for one correct pair or two correct x values or two correct y values. If B0 scored **and** at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $y = x^2 - 9x + 21$ or $y = 2x - 3$

Question 163

$\frac{3}{5}$ oe and $-\frac{7}{2}$ oe	**1**	

Question 164

$\frac{8-5x-x^2}{7(x+3)}$ or $\frac{8-5x-x^2}{7x+21}$ final answer	**3**	**B1** for $7 \times 2 - (x + 2)(x + 3)$ or better seen **B1** for common denominator $7(x + 3)$ oe isw

Question 165

[x =] $\frac{y+2}{y+3}$ oe final answer	**4**	**M1** $y(1 - x) = 3x - 2$ or better **M1** for correctly isolating x terms on one side FT *their* first step/bracket expansion **M1dep** for correctly removing factor of x FT *their* previous step **M1dep** for correct division to isolate x Max 3 marks for an incorrect answer

Question 166

$x \leqslant 1$ final answer	**3**	**M1** for $20 - 15x \geqslant 6 - x$ or $4 - 3x \geqslant \frac{6}{5} - \frac{x}{5}$ **M1** for correctly isolating terms in x FT *their* first step of dealing with the 5 $20 - 6 \geqslant -x + 15x$ or $-3x + \frac{x}{5} \geqslant \frac{6}{5} - 4$

Question 167

Correctly eliminates one variable	**M1**	
$[x =] -3$, $[y =] 0.5$ oe	**A2**	**A1** for either correct If M0 scored, **SC1** for 2 values satisfying one of the original equations If 0 scored, **SC1** for correct answers from no working

Question 168

$x^2+6x-40$ [=0] or $y^2-40y-41$ [=0]	**M2**	**M1** for correct method to eliminate one variable e.g. $x^2-2(11-3x)=18$ or $\frac{(11-y)^2}{3^2}-2y=18$
$(x-4)(x+10)$ [=0] or $(y-41)(y+1)$ [=0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula for *their* quadratic equation or for correctly completing the square for *their* quadratic equation
$x=4, y=-1$ $x=-10, y=41$	**B2**	**B1** for $x=4, x=-10$ or for $y=-1, y=41$ or for a correct pair of x and y values If B0 scored and at least 1 method mark scored **SC1** for correct substitution shown of both of *their* x values or *their* y values into $3x+y=11$ or $x^2-2y=18$

Question 169

$3a(4a^2-7)$ final answer	**2**	**B1** for $3(4a^3-7a)$ or $a(12a^2-21)$ or for $3a(4a^2-7)$ seen then spoilt

Question 170

$\frac{x}{5+x}$ final answer nfww	**3**	**B1** for $x(5-x)$ **B1** for $(5-x)(5+x)$ or

Question 171

$x \geqslant 2$ final answer	**2**	**M1** for $12x-4x \geq 13+3$ oe

Question 172

(a)	$9p(2x-3)$ final answer	**2**	**B1** for $9(2px-3p)$ or $p(18x-27)$ or $3p(6x-9)$ or $9p(2x-3)$ seen and spoilt
(b)	$(m+n)(t-1)$ final answer	**2**	**B1** for $m(t-1)+n(t-1)$ or $t(m+n)-[1](m+n)$ or correct answer seen and spoilt

Question 173

792 or 792.1…	**2**	**M1** for $\frac{4\times 7^3}{\sqrt{3}}$ oe or **B1** for 1372

Question 174

(a)	$(2m+3p)(1-4k)$ final answer	**2**	**B1** for $2m+3p-4k(2m+3p)$ or better or $2m(1-4k)+3p(1-4k)$ or correct answer seen and spoilt
(b)	$5(x-2y)(x+2y)$ final answer	**3**	**B2** for $(5x-10y)(x+2y)$ or $(x-2y)(5x+10y)$ or correct answer seen then spoilt or **B1** for $5(x^2-4y^2)$ or for $(x-2y)(x+2y)$

Question 175

(–2, –1) and (6, 7)	**4**	**B3** for $x=-2$ and 6 OR **M1** for $x^2-3x-11=x+1$ or better **M1** for correct method to solve *their* quadratic e.g. $(x+2)(x-6)$ If 0 scored, **SC1** for one correct pair of coordinates

Question 176

$(1-q)(1-a)$ or $(a-1)(q-1)$ final answer	**2**	**B1** for $1-q-a(1-q)$ or $1-a-q(1-a)$ or better or correct answer seen and spoilt

Question 177

$7y(2x-y)$ final answer	**2**	**B1** for $7(2xy-y^2)$ or $y(14x-7y)$ or $7y(2x-y)$ seen then spoilt

Question 178

(a)	7.2 oe	**1**	
(b)	$[\pm]\sqrt{\frac{2s}{a}}$ final answer	**2**	**M1** for $\frac{s}{a}=\frac{1}{2}t^2$ or $2s = at^2$ or better

Question 179

$2x^3+x^2-25x+12$ final answer	**3**	**B2** for correct unsimplified expanded expression or for simplified four-term expression of correct form with 3 terms correct or **B1** for correct expansion of 2 brackets with at least 3 terms out of 4 correct

Question 180

$[x=]$ 9 $[y=]$ 3	**2**	**B1** for each answer

Question 181

$3x+x^3$ final answer	**2**	**B1** for one correct term from two in final answer or for correct answer then spoilt

Question 182

$-50y$	**1**	

Question 183

(a)	$(1+x)(1-y)$ final answer	**2**	**B1** for $1+x-y(1+x)$ or $1-y+x(1-y)$
(b)	$2x(x+3y)(x-3y)$ final answer	**3**	**B2** for $2x(x^2-9y^2)$ or correctly factorising into two brackets e.g. $(2x^2+6xy)(x-3y), (x^2-3xy)(2x+6y)$ or **B1** for $2(x^3-9xy^2)$ or $x(2x^2-18y^2)$ or for $(x+3y)(x-3y)$

Question 184

$2x^3 - 5x^2 - 4x + 12$ final answer	**3**	**B2** for correct expansion of the three brackets unsimplified or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two of the three given brackets with at least three terms out of four correct

Question 185

[x =] 4 [y =] –1	**2**	**B1** for each

Question 186

0 and –3	**3**	**B2** for $x^2 + 3x$ [= 0] or better or **M1** for $10 - 6x = x^2 - 3x + 10$ oe or for correct simplification of *their* quadratic to the form $ax^2 + bx + c$ [= 0] or better or finding $y = 28$ and $y = 10$

Question 187

Correctly eliminating one variable	**M1**	
[x =] 5	**A1**	
[y =] –2	**A1**	If **M0** scored **SC1** for 2 values satisfying one of the original equations.

Question 188

'(a)	$-\frac{1}{4}$ oe	**2**	**M1** for $15t + t = 4 - 8$ oe
(b)	9.5 oe	**2**	**M1** for $25 - 2u = 3 \times 2$ oe or for $\frac{25}{3} - 2 = \frac{2u}{3}$

Question 189

$2g(4 - g)$ final answer	**2**	**B1** for $2(4g - g^2)$ or for $g(8 - 2g)$ or for $2g(4 - g)$ seen then spoiled

Question 190

$\frac{-5 \pm \sqrt{5^2 - 4 \times 1 \times -7}}{2 \times 1}$	**B2**	**B1** for $\sqrt{5^2 - 4 \times 1 \times -7}$ and if in form $\frac{p + \sqrt{q}}{r}$ or $\frac{p - \sqrt{q}}{r}$ **B1** for $p = -5$ and $r = 2 \times 1$
−6.14 and 1.14 cao	**B2**	**B1** for 1 correct answer for −6.1 and 1.1 or −6.140... and 1.140... or 6.14 and −1.14 or correct answers seen in working

Question 191

d^6	**1**	

Question 192

72.6	**2**	**M1** for $4 - 9.8 \times -7$ or better

Question 193

(a)	53	**2**	**M1** for $a \times 8^2 + b = 181$ oe seen
(b)	−8	**1**	

Question 194

(a)	5	**1**	
(b)	$x \geqslant 3$ final answer	**3**	**M1** for correct first step $11x - 3 \geq 4x + 18$ or $5.5x - 1.5 \geqslant 2x + 9$ or better **M1** for correctly collecting *their* x terms on one side and *their* number terms on the other side e.g. $11x - 4x \geqslant 18 + 3$ or better

Question 195

$27x^9$ final answer	**2**	**B1** for answer $27x^n$ or nx^9, or for correct answer seen and spoilt

Question 196

$16y^{18}$ final answer	**2**	**B1** for $16y^k$ or ky^{18} as final answer or correct answer spoiled

Question 197

$x^2 - 4x + 4$ [= 0]	**M2**	**M1** for $9 - 4x = 5 - x^2$ oe
$(x - 2)(x - 2)$	**M1**	Accept alt methods e.g. use of formula, complete the square for *their* 3 – term quadratic equation
(2, 1)	**B2**	**B1** for $x = 2$

Question 198

[a =] – 3 [b =] 1 [c =] – 15	**3**	**B1** for $a = -3$ **B1FT** for $b = 7 + 2 \times$ *their a* **B1FT** for $c = 6 + 7 \times$ *their a* If B0 scored **B1** for correct expansion of a pair of brackets or of three brackets $(x^2 + ax + 2x + 2a)[2x + 3]$ or $[x + a](2x^2 + 4x + 3x + 6)$ or $2x^3 + (2a + 7)x^2 + (7a + 6)x + 6a$ oe or for $b = 7 + 2a$ or for $c = 6 + 7a$

Question 199

[d =] $\frac{T^2 + e}{3}$ oe final answer	**3**	**M1** for $T^2 = 3d - e$ **M1** for isolating term in d **M1** for dividing by 3 Max 2 marks if answer incorrect

Question 200

(2, 3) and (–2, –1)	**4**	**B3** for $x = 2$ and $x = -2$ or **B2** for $x^2 - 4[= 0]$ or better or for (2, 3) or (–2, –1) or **M1** for $x + 1 = x^2 + x - 3$ oe

Question 201

[±] $\sqrt{\frac{y + x}{2}}$ oe final answer	**3**	**M1** for isolating term in w **M1** for division by 2 **M1** for square root Max 2 marks if answer incorrect

Question 202

(a)	1.2 oe	**2**	**B1** for 3^{2p+3p} or 3^6 soi
(b)	$2x^2$ final answer	**2**	**B1** for kx^2 or $2x^k$ as final answer or correct answer spoiled

Question 203

$5w - t$ final answer	**2**	**B1** for $2t + 2w$ or $3w - 3t$ or for $5w - t$ seen then spoiled or for $5w$ or $-t$ in the final answer

Question 204

16	**2**	**B1** for –14 or **M1** for $30 - 2 \times 7$

Question 205

(a)	n^6 final answer	**1**	
(b)	$4x^4$ final answer	**2**	**B1** for kx^4 or $4x^k$ as final answer or correct answer seen and then spoiled
(c)	$9y^8$ final answer	**2**	**B1** for ky^8 or $9y^k$ final answer or correct answer seen and spoiled

Question 206

(a)	$7m(6k - 5)$ final answer	**2**	**B1** for $7(6mk - 5m)$ or $m(42k - 35)$ as final answer or $7m(6k - 5)$ seen and then spoiled
(b)	$(h + 12)(h - 12)$ final answer	**1**	

Question 207

(a)	5	**1**	
(b)	90	**1**	

Question 208

$[a =]$ 64 $[b =] -8$	**2**	**B1** for each or for both $(x - 8)^2$ and $x^2 - 16x + 64$

Question 209

(a)	$\frac{1}{5}$ oe	**1**	
(b)	$64x^9$	**2**	**B1** for $64x^k$ or kx^9 as final answer or correct answer spoiled

Question210

$3m+10k$ final answer	**2**	**B1** for $3m$ or $10k$ in final answer or for $3m+10k$ seen and spoilt

Question 211

$\frac{A-\pi r^2}{\pi d}$ oe final answer	**2**	**M1** for $A-\pi r^2=\pi dh$ or $\frac{A}{\pi d}=\frac{\pi r^2}{\pi d}+h$ or $\frac{A}{\pi}-r^2=dh$

Question 212

(a)	$2g^8$ final answer	**2**	**B1** for final answer kg^8 or $2g^k$ or correct answer seen then spoilt
(b)	$125k^6$ final answer	**2**	**B1** for final answer ck^6 or $125k^c$ or correct answer seen then spoilt

Question 213

$[t=]\ 3$ $[w=]\ -2$	**2**	**B1** for each

Question 214

$xy(4x-5y)$ final answer	**2**	**B1** for $y(4x^2-5xy)$ or $x(4xy-5y^2)$ or $xy(4x-5y)$ seen then spoilt

Question 215

$6x-9y$ or $3(2x-3y)$ final answer	**2**	**B1** for $6x$ or $-9y$ in final answer or $6x-9y$ seen then spoilt

Question 216

$4x^2 + 3x - 85[= 0]$ or $16y^2 - 113y + 7[= 0]$ oe simplified	**M2**	**M1** for $4(x^2 - 18) + 3x = 13$ or $x^2 - 18 = \frac{13 - 3x}{4}$ or $y = \left(\frac{13 - 4y}{3}\right)^2 - 18$ oe or better
correct method to solve *their* quadratic equation e.g. factors, quadratic formula, completing the square	**M1**	$\frac{-3 \pm \sqrt{3^2 - 4 \times 4 \times -85}}{2 \times 4}$ oe, $(4x - 17)(x + 5)$ $\frac{-(-113) \pm \sqrt{(-113)^2 - 4 \times 16 \times 7}}{2 \times 16}$ oe, $(16y - 1)(y - 7)$
$x = -5$ $y = 7$ $x = \frac{17}{4}$ oe $y = \frac{1}{16}$ oe	**B2**	**B1** for one correct pair or two correct x values or two correct y values If B0 scored and at least 2 method marks scored, **SC1** for correct substitution of both of their x values or their y values into $4y + 3x = 13$ or $y = x^2 - 18$

Question 217

(a)	$3(2m + 5t)(2m - 5t)$ final answer	**3**	**B2** for $(6m + 15t)(2m - 5t)$ or $(2m + 5t)(6m - 15t)$ or **B1** for $3(4m^2 - 25t^2)$ or $(2m + 5t)(2m - 5t)$
(b)	$(x + 3)(y + 5)$ final answer	**2**	**B1** for $x(y + 5) + 3(y + 5)$ or $y(x + 3) + 5(x + 3)$

Question 218

Correctly equating one set of coefficients	**M1**	
Correct method to eliminate one variable	**M1**	
$x = 10$, $y = -2$	**A2**	**A1** for $x = 10$ **A1** for $y = -2$ If M0 scored **SC1** for 2 values satisfying one of the original equations.