

SIMPLIFYING ALGEBRA

Pearson Edexcel - Thursday 4 June 2020 - Paper 2 (Calculator) Foundation Tier

1.

3	$6e$	B1		
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Pearson Edexcel - Monday 8 June 2020 - Paper 3 (Calculator) Foundation Tier

2.

14	(a)	$5x + y$	M1	for method to collect terms, eg $5x + y$	May be seen in working. Accept if no ambiguity. Accept 1y.	
			A1	cao		
	(b)	3	M1	for subtracting 7 from both sides or dividing each term by 5 as a first step, eg $5p = 15$ or $5p = 22 - 7$ or $\frac{5p}{5} + \frac{7}{5} = \frac{22}{5}$		Must be carried out, not just intention. Division by 5 must be all terms.
			A1	cao		

Pearson Edexcel - Thursday 6 June 2019 - Paper 2 (Calculator) Foundation Tier

3.

8	(a)	$7ab$	B1	for $7ab$	
	(b)	y^3	B1	cao	
	(c)	$\frac{e}{f}$	M1	for a correct first step, eg. numerator of $e^3 \times f$ or denominator of $e^2 \times f^2$ OR $e \div f$ or $e \times f^{-1}$ OR relevant crossings out for all the e 's and all the f 's	
			A1	for $\frac{e}{f}$ or ef^{-1}	

Pearson Edexcel - Tuesday 11 June 2019 - Paper 3 (Calculator) Foundation Tier

4.

9		$11e + 5f$	M1	for either $11e$ or $5f$	
			A1	for $11e + 5f$	

Pearson Edexcel - Thursday 8 November 2018 - Paper 2 (Calculator) Foundation Tier

5.

7	(a)	$4m$	B1	cao	
	(b)	$8np$	B1	cao	

Pearson Edexcel - Thursday 24 May 2018 - Paper 1 (Non-Calculator) Foundation Tier

6.

6	(a)	$12t$	B1	$12t$	Accept $t12$ but not $12 \times t$ or $t \times 12$ Accept $a7$ or $7 \times a$ or $a \times 7$ Partial simplification of $5a + 2a$ or $8a - a$ does NOT get the mark
	(b)	$7a$	B1	$7a$	

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7.

3	(a)		$15fg$	B1	cao
	(b)		t^2	B1	cao
	(c)		$4n$	B1	cao

Pearson Edexcel - Wednesday 8 November 2017 - Paper 3 (Calculator) Foundation Tier

8.

2		$2y$	B1	for $2y$
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Pearson Edexcel – Specimen 2 - Paper 1 (Non-Calculator) Foundation Tier

9.

19	a		$y(y+27)$	B1
	b		t^6	B1
	c		w^5	B1

Pearson Edexcel – Specimen 2 - Paper 2 (Calculator) Foundation Tier

10.

17	(a)		$4x + 6y$	M1 for $4x$ or $6y$ A1 for $4x + 6y$ or $2(2x + 3y)$
	(b)		$5(2x - 3)$	B1 cao
	(c)		4	M1 for method to isolate terms in p on one side and constants on the other side A1 cao

11.

24	(a)		$13y - 1$	M1 for expansion of one bracket A1 for full simplification
	(b)		$35u^3w^7$	B1 for 2 of 35 , u^3 and w^7 correct B1 cao

Pearson Edexcel – Specimen 1 - Paper 2 (Calculator) Foundation Tier

12.

4	(a)		$6f$	B1
	(b)		$16mn$	B1
	(c)		$2t^2$	B1 cao

13.

16	(a)		1.5	M1 for rearranging, eg $11 - 5 = 4c$ A1 1.5 oe
	(b)		-3	M1 for a first step of either dividing both sides by 5, eg $\frac{5(e+7)}{5} = \frac{20}{5}$ or for expanding the bracket, eg $5 \times e + 5 \times 7 = 20$ A1 cao
	(c)		m^6	B1 cao

Pearson Edexcel – Specimen 1 - Paper 3 (Calculator) Foundation Tier

14.

7	(a)		5	B1 cao
	(b)		12	B1 cao
	(c)		d^5	B1

OCR Thursday 05 November 2020- Morning (Non-Calculator) Foundation Tier

15.

15	(a)		$2a + 3b$ final answer	2	B1 for $2a$ or $3b$ in answer If 0 scored, SC1 for correct answer seen then spoilt	Eg $2a + 3b = 5ab$
15	(b)(i)		$4x + 12$ final answer	1		
15	(b)(ii)		$x^2 + 3x - 10$	2	Mark final answer B1 for 3 of $x^2, 5x, -2x, -10$	[+] $3x$ counts as two terms For B1 could be in a grid

OCR Tuesday 5 November 2019 – Morning (Calculator) Foundation Tier

16.

5	a		$2a$	1		
	b		$11g + 3f$ final answer	2	B1 for $11g$ or $3f$ in answer	

OCR Thursday 07 November 2019- Morning (Non-Calculator) Foundation Tier

17.

16	(a)		She added the terms oe $2a^3$	1 1		In all 3 parts any incorrect statement treat as choice Allow correct descriptions of what Martina should have done in each part See AG
16	(b)		She divided the powers oe x^8	1 1		See AG
16	(c)		She squared ($\frac{1}{2} \times 6 \times 5$) oe 75	1 1		See AG

OCR Thursday 6 June 2019 – Morning (Non-Calculator) Foundation Tier

18.

10	(a)	(i)	$t + 8u$ final answer	2	M1 for $[+1]t$ or $[+]8u$ in final answer If 0 scored SC1 for correct answer seen then spoilt	Accept $1t + 8u, 8u + 1t$ Condone capitals for 2 or 1 marks eg $t + 8u = 9tu$
		(ii)	$12a^3$ final answer	2	B1 for $12a^k$ or ka^3 ($k \neq 0$)	
	(b)		$x = \sqrt{y+1}$ final answer	2	M1 $\sqrt{y+1}$ final answer or for $x^2 = y + 1$ or for correct FT step to answer after incorrect first step	Ignore \pm or $-$ for 2 marks or M1 Condone $\sqrt{y+1} = x$ For M1 condone $y + 1 = x^2$ eg $x = \sqrt{y-1}$, after $x^2 = y - 1$ seen.

OCR Tuesday 11 June 2019 – Morning (Calculator) Foundation Tier

19.

28	a	i	h^0 or 1 final answer	1		
		ii	f^6 final answer	1		
	b		$\frac{4}{a}$ or $4a^{-1}$ final answer	4	M1 for $2a \times 2a \times 2a$ soi by $8a^3$ M1 for $\frac{32a^2}{\text{their}(2a \times 2a \times 2a)}$ A1 for 4 as numerator or coefficient of a A1 for a as denominator	Their $2a \times 2a \times 2a$ must be algebraic and three dimensional
			g per mm^3 cao	1		Accept correct forms for 1 mark eg grams/ mm^3 or g mm^{-3} or $\frac{\text{g}}{\text{mm}^3}$ etc

OCR Thursday 8 November 2018 – Morning (Non-Calculator) Foundation Tier

20.

15	(a)		$3x^2 + xy - 2y^2$ final answer	3	M2 for $3x^2 - 2xy + 3xy - 2y^2$ oe or M1 for two correct terms	Accept e.g. $3yx$ May be seen in a table for M1
	(b)		$c = 4$ $d = -1$	5	M4 for $3d + 20 = 17$ oe or M3 for $6 + c = 10$ or $3d + 5c = 17$ or $6x + cx = 10x$ or M2 for $6x + 3d + cx + 5c$ oe or M1 for $6x + 3d$ or $cx + 5c$ OR B3 for $c = 4$ and B2 for $d = -1$	Accept e.g. c5
	(c)		2, 5 nfw	3	M2 for $(x - 2)$ and $(x - 5)$ or M1 for $(x + a)$ and $(x + b)$ where $ab = 10$ or $a + b = -7$ B1 ft their quadratic factors If 0 scored SC1 for answer ± 2 and ± 5	

OCR Monday 12 November 2018 – Morning (Calculator) Foundation Tier

21.

7	(a)		Hollow circle at 3 only	1		No other blobs
			Line/arrow "pointing" right from 3	1	Marks independent	Open line or arrow only and condone mark/blob over 8 or x If line, must reach approx. 8 Condone line/arrow starting closer to 3 than 4
	(b)		$11a - 2c$ final answer	2	B1 for $11a$ or $-2c$ seen	Accept in any order $11a + -2c$ scores 1 mark
	(c)		6	2	M1 for $2x = 12$ or $\frac{x}{3} = 2$ or $\frac{x}{1.5} = 4$	If T&I only correct answer scores Must be algebraic method for M1 Do not accept embedded answers

OCR Thursday 7 June 2018 – Morning (Non-Calculator) Foundation Tier

22.

4	a	i	$4x - 3y$ final answer	2	B1 for $4x$ or $-3y$ in final answer	$4x + -3y$ scores B1 only
		ii	w^6 final answer	1		
		iii	$15c^3d$ final answer	1		Accept $15dc^3$ Do not accept eg $15 \times c^3 \times d$
	b	i	13	1		
		ii	3	1		

OCR Thursday 2 November 2017– Morning (Calculator) Foundation Tier

23.

6	(a)	(i)	$4p$	1		
		(ii)	$5j - 2k$	2	B1 for $5j$ or $-2k$ in final answer	
	(b)		144	2	M1 for 120 or 24 or $10 \times 12 + 6 \times 4$	Not 120h or 24t
	(c)		$d = \frac{f-e}{7}$ oe nfw	2	M1 for correct first step or $\frac{f-e}{7}$	$e + 7d = f$ or $e - f = -7d$ oe

OCR Monday 6 November 2017– Morning (Calculator) Foundation Tier

24.

6	a	i	$13c - 7d$ final answer	3	B2 for one term correct in final answer or M1 for $[4(c + 2d)] = 4c + 8d$ seen or $[3(3c - 5d)] = 9c - 15d$ seen	$13c + -7d$ scores B2 only
		ii	$20ab$ final answer	1		Accept $20ba$
	b	i	$2(3g + 4h)$ final answer	1		Condone omission of final bracket
		ii	$5x(x - 3)$ final answer	2	M1 for $5(x^2 - 3x)$ or $x(5x - 15)$ or $5x(x + 3)$	Condone omission of final bracket

25.

23	a	i	Valid explanation	1	Such as 'because $2n$ is always even so $2n + 1$ will be odd'	Must mention even and odd See Appendix
		ii	$2n + 3$ oe	1		
	b		$2n + 1 + 2n + 3$ $= 4n + 4 [= 4(n + 1)]$ which is a multiple of 4	M1 A1	If 0 scored SC1 for $2n + 1 + their (2n + 3)$	their $(2n + 3)$ must be an algebraic expression in n

Pearson Edexcel – Sample Papers - Paper 1 (Non-Calculator) Foundation Tier

26.

22		$m^2 + 10m + 21$	M1 for at least 3 terms out of a maximum of 4 correct from expansion A1
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Pearson Edexcel – Sample Papers - Paper 3 (Calculator) Foundation Tier

27.

2	(a)		$7x$	B1
	(b)		$8y^2$	B1

OCR Thursday 25 May 2017 – Morning (Calculator) Foundation Tier

28.

7	(a)		$12t - 10u$ or $2(6t - 5u)$ cao	2	B1 for $12t$ or $-10u$ in final answer	$12t + -10u$ scores B1
	(b)		$5(v + 4w)$	1		Condone omission of final bracket
	(c)		-3 and -7	3	M2 for $(x + 3)$ and $(x + 7)$ M1 for $(x + a)$ and $(x + b)$ where $ab = 21$ or $a + b = 10$ B1 ft their quadratic factors If 0 scored SC1 for answer ± 7 and ± 3	ft their quadratic factors condone omission of final bracket

OCR Thursday 8 June 2017 – Morning (Non - Calculator) Foundation Tier

29.

5	a		$3x^2 + 6xy$ final answer	2	B1 for $3x^2$ or $6xy$ seen	Condone $6yx$ Do not accept eg $6 \times x \times y$
	b	i	4	1		
		ii	33	2	M1 for $\frac{x}{3} = 9 + 2$ or better or M1 for $x = a \times b$ following $\frac{x}{b} = a$	Alternative method M1 for $x - 6 = 27$ or M1 for $x = a + b$ following $x - a = b$

AQA Tuesday 19 May 2020 – Morning (Non-Calculator) Foundation Tier

30.

Q	Answer	Mark	Comments
14(a)	$6x = 13 + 11$ or $6x = 24$ or $\frac{24}{6}$	M1	oe eg $-6x = -13 - 11$ or $-6x = -24$ or $\frac{-24}{-6}$
	4	A1	
	Additional Guidance		
	Embedded answer, eg $6 \times 4 - 11 = 13$		M1A0
	24 with no other working		M0A0
	Flow chart method, if 4 not given as the answer. $x \rightarrow \times 6 \rightarrow -11 \rightarrow 13$ and $13 \rightarrow +11 \rightarrow \div 6 \rightarrow x$		M1A0

Q	Answer	Mark	Comments	
14(b)	$(2 \times 4a =) 8a$	B1		
	$\left(\frac{15a}{3} =\right) 5a$	B1		
	$13a + 2$	B1ft	ft B1B0 or B0B1 for their $8a +$ their $5a + 9 - 7$ is in the form $pa + q$ do not award with further incorrect work eg $13a + 2 = 15a$	
	Additional Guidance			
	13a + c could come from incorrect working			
	eg $8a + 4 + 9 + 5a - 7 = 13a + 16$ (their $8a$ is $8a + 4$)			B0B1B0ft
	eg $8a + 4 + 9 + 5a - 7 = 13a + 6$ (their $8a$ is $8a + 4$)			B0B1B1ft
	eg $8a + 9 + 5a - 7 = 13a + 16$			B1B1B0ft
	eg $13a + 16$ (no other working)			B1B1B0ft
	$6a + 9 + 5a - 7 = 11a + 2$			B0B1B1ft
	$8a + 9 + 12a - 7 = 20a + 2$			B1B0B1ft
$8a + 9 + 5 - 7 = 8a + 7$			B1B0B1ft	
$8a + \frac{15a}{3} + 7$			B1B0B0ft	
$6a + 9 + 12a - 7 = 18a + 2$			B0B0B0ft	
$6a + 5a + 16 = 11a + 16$			B0B1B0ft	

AQA Thursday 4 June 2020 – Morning (Calculator) Foundation Tier

31.

Q	Answer	Mark	Comments
	All 4 correct matches	B4	B1 for each correct match
Additional Guidance			
12		B4	
	Two different matches from left hand column is choice for that box		
	Accept any unambiguous indication		

AQA Monday 8 June 2020 – Morning (Calculator) Foundation Tier

32.

Q	Answer	Mark	Comments
7	Two correct matches	B2	B1 one correct match
	Additional Guidance		
	Do not accept two lines from an algebra box		
	<div style="display: flex; flex-direction: column; align-items: center; gap: 20px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$4x < 12$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$6x = 24$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$5x + 3$</div> </div>	<div style="display: flex; flex-direction: column; align-items: center; gap: 20px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Term</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Equation</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Inequality</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Expression</div> </div>	B2

AQA Tuesday 21 May 2019 – Morning (Non-Calculator) Foundation Tier

33.

28	$x^2 + 5x - x - 5$	M1	three or four terms with three correct $x^2 + 4x + k$ implies M1
	$x^2 + 4x - 5$	A1	
	Additional Guidance		
	Further work, eg $x^2 + 4x - 5 = 5x - 5$		M1A0
	$y = x^2 + 4x - 5$ or $x^2 + 4x - 5 = 0$		M1A0
	$x^2 + 4x - 4$		M1A0
	$x^2 + 4x$		M1A0
	Condone $1x$ for x eg $x^2 + 5x - 1x - 5$		at least M1
	Terms may be seen in the grid method or in a list where a plus sign can be implied		

AQA Tuesday 6 November 2018 – Morning (Non-Calculator) Foundation Tier

23(a)	-1	B1	
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23(b)	$n^2 + n$ or $n + n^2$	B1	
	Additional Guidance		
	Accept $1n^2 + 1n$ or $1n^2 + n$ or $n^2 + 1n$ etc...		B1
	Do not accept $n \times n + n$ or $n^2 + n1$		B0

23(c)	Alternative method 1		
	$(n + n + 1 =) 2n + 1$ and states that $2n$ is even and states that even + 1 = odd or even + odd = odd	B2	B1 $(n + n + 1 =) 2n + 1$
	Alternative method 2		
	States that one of the numbers is even and the other is odd and states that even + odd = odd	B2	B1 states that one of the numbers is even and the other is odd or states that even + odd = odd
	Additional Guidance		
	Numerical examples with no other explanation		B0
$n + n + 1 = 2n + 1 = 3n$		B0	

AQA Thursday 8 November 2018 – Morning (Calculator) Foundation Tier

35.

3	$14x - 3$	B1	
	Additional Guidance		

AQA Thursday 24 May 2018 – Morning (Non-Calculator) Foundation Tier

36.

3	$9a^2$	B1	
	Additional Guidance		

AQA Thursday 7 June 2018 – Morning (Calculator) Foundation Tier

37.

1	$y + y$	B1	
	Additional Guidance		

38.

	All four correct	B3	B2 for any two or three correct B1 for any one correct
Additional Guidance			
7			
	Do not accept two lines from an algebra box		

AQA Tuesday 12 June 2018 – Morning (Calculator) Foundation Tier

39.

17	$6x$	B1	
	Additional Guidance		

AQA Monday 6 November 2017 – Morning (Calculator) Foundation Tier

40.

5a	y^2	B1	
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5b	$4a + 11$	B2	B1 for each term
	Additional Guidance		
	$4a$ or 11 or $4a + 11$ seen and answer eg $15a$		B1
	$4a + 11$ seen and then 'solves'		B1
	11 and -11 seen (without $4a$ seen)		B0

AQA Thursday 25 May 2017– Morning (Non-Calculator) Foundation Tier

41.

17	$y^6 \div y^2$	B1	
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AQA Tuesday 13 June 2017 Morning– Morning (Calculator) Foundation Tier

42.

	$a^3 + 2b$	B2	B1 for $a^3 (+)$ or $(+) 2b$
	Additional Guidance		
	Do not accept $2 \times b$ or $b2$ for $2b$		
	Do not accept 3a for a^3		
	Do not accept further working for B2 eg $a^3 + 2b = a^3 2b$		B1
	Do not accept further working for B1 eg $3a + 2b = 5ab$ or $a^3 b^2 = a^3 b^2$		B0
5(a)	$a^3 + b^2$		B1
	$3a + 2b$		B1
	$a^3 2b$		B1
	$a^3 2b = a^3 2b$		B1
	$a^3 \times 2b$ or $a^3 2b$ without working for B1		B0
	$a^3 \times b^2$ or $a^3 b^2$		B0
	$3a \times 2b$		B0
	$3a - 2b$		B0

5(b)	$5x (+) 15$	B1	Implied by correct answer
	$4x + 17$	B2ft	B2ft their $5x + 15$ in the form $5x + b$ or $ax + 15$, both their terms with correct ft in final answer B1ft $4x$ or $(+)17$ B1ft their $5x + 15$ in the form $5x + b$ or $ax + 15$, one of their terms with correct ft in final answer
	Additional Guidance		
	ft $4x$ or $(+)17$ or must use $5x + b - x + 2$ or $ax + 15 - x + 2$		
	$4x + 17$ with no expansion seen		B1B2
	Ignore further working with an attempt to solve after their $4x + 17$ eg $4x + 17 = 0$ followed by $x = -4.25$		B1B2
	Do not ignore further working with an attempt to simplify after their $4x + 17$ eg $4x + 17$ followed by $21x$		B1B1
	$5x + 15 - x + 2$ followed by $4x + 15 = -2$		B1B1
	$5x + 3$ followed by $4x + 5$ also $5x - 15$ followed by $4x - 13$		B0B2ft
	Ignore further working after $5x + 15$ for first B1 eg $5x + 15$ followed by $20x$ and $20x - x + 2$ followed by $19x + 2$		B1B0
	$5x \ 15$		B1
	$4x + k, k \neq 17$, with no expansion seen		B0B1ft
	$kx + 17, k \neq 4$, with no expansion seen		B0B1ft
	$5x + 15 - 5x + 10$ followed by 25		B1B0
	$5x + 3$ followed by $4x + 1$		B0B1ft
	$5x^2 + 15$ followed by $5x^2 - x + 17$		B0B1ft
	$5x + 3$ followed by $4x + 1$ followed by $5x$		B0B0ft
	$5x + 3$ followed by $6x + 1$		B0B0ft
	$5x^2 + 3$ followed by $5x^2 - x + 5$		B0B0ft

AQA Sample Paper 1– Morning (Non-Calculator) Foundation Tier

43.

4	$3a - 6$	B1	
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AQA Sample Paper 2– Morning (Calculator) Foundation Tier

44.

8(a)	$5w = 24 + 11$ or $5w = 35$	M1	oe $35 \div 5$
	7	A1	
8(b)	$15x + 12y$ or $12y + 15x$	B1	
8(c)	$2x + y^2$ or $y^2 + 2x$	B1	