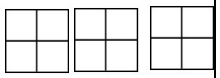
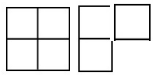
Qn	Working	Answer	Marks	Notes
1	eg 20 ÷ 2.5 (= 8) **or** 32 ÷ 4 (= 8) **or** 20 ÷ 10 (= 2) **or** 32 ÷ 16 (= 2)			M1 for a method to find a key
		8		A1 key completed correctly
	eg 24 ÷ [their 8] **or** 14 ÷ [their 8] **or** 24 ÷ [their 2] **or** 14 ÷ [their 2]			M1 complete method to find the picture for Miss Okoye **or** Dr Syed
		Miss Okoye  Dr Syed 	4	A1
				Total 4 marks

2	a	5 − 9			M1
			−4	2	A1
	bi		4	1	B1
	bii	−7, −6, −5, −1, 0, 4, 4			M1 for writing the values in the correct order, condone one error or omission **or** for an answer of 0
			−1	2	A1
					Total 5 marks

3	(a)		$\frac{11}{15}$	1	B1oe
	(b)		$4\frac{3}{5}$	1	B1oe eg $4\frac{6}{10}$
	(c)		$\frac{23}{100}$	1	B1oe eg $\frac{46}{200}$
	(d)		0.4	1	B1 Accept 0.40
	(e)		3.555, 3.61, 3.7, 3.82, 3.9	1	B1
					Total 5 marks

4			CO, CM, CW, EO, EM, EW, TO, TM, TW	2	B2 for all combinations with no repeats or incorrect combinations If not B2 then award B1 for at least 4 correct combinations (ignore repeats or incorrect combinations)
					Total 2 marks

5	a		8632	1	B1 cao
	b		24	1	B1 cao
	c		17	1	B1 cao
					Total 3 marks

6	(−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14)	Correct line between $x = -2$ and $x = 4$	3	B3	for a correct line between $x = -2$ and $x = 4$
				B2	for a correct straight line segment through at least 3 of (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) **OR** for all of (−2, −4) (−1, −1) (0, 2) (1, 5) (2, 8) (3, 11) (4, 14) plotted but not joined **OR** for a line drawn with a positive gradient through (0, 2) and clear intention to use a gradient of 3
				B1	for at least 2 correct points stated (may be in a table) **OR** for a line drawn with a positive gradient through (0, 2) **OR** for a line with a gradient of 3
					Total 3 marks

7	a		$15rt$	1	B1	oe
	b	eg $(x =)\ (27 - 5) \div 4$			M1	complete method
			5.5	2	A1	oe
	c	$7 \times 2 - 5 \times 4$			M1	
			−6	2	A1	
	d	$2 \times (-3)^2 - 5$			M1	
			13	2	A1	
						Total 7 marks

8	(a)		(2, 3)	1	B1	
	(b)		(−3, −1)	1	B1	
	(c)		(−0.5, 1)	2	B2	B1 for (−0.5, y) or (x, 1) or (1, −0.5)
						Total 4 marks

9	(a)		70 216	1	B1	cao
	(b)		1, 2, 5 or 10	1	B1	Any of these values with no other incorrect value
	(c)		25 or 36	1	B1	One or both of 25 or 36 and no other incorrect value
	(d)		15	1	B1	
	(e)		42 – 6 ÷ (6 – 3)	1	B1	Allow 42 – (6 ÷ (6 – 3))
						Total 5 marks

10	a		Kite drawn	1	B1	
	b		Octagon	1	B1	
	ci		Cuboid	1	B1	
	cii		8	1	B1	
						Total 4 marks

11	(a)		Frequencies and tallies of 2, 3, 8, 4, 5, 2	2	B2	All frequencies <u>and</u> tallies correct B1 for 3, 4 or 5 frequencies or tallies correct NB. Frequencies and tallies must be in the correct column. Accept 2/24 etc. in frequency column
	(b)		3	1	B1ft	Follow through from table
	(c)		Sensible statement	1	B1	Not enough 1's or 6's Too many 3's Rolled a 3 a third of the times Should expect to get 4 of each number
						Total 4 marks

12	(a)		$4k$	1	B1	
	(b) (i)		94	1	B1	
	(ii)		38	1	B1	
	(c)		519	1	B1	
	(d)			2	M1	A factor tree / division ladder of 3 or more factors (≠1), multiplying to 800, which must include 2 and 5. Condone 1 error when product ≠ 800
			$2\times2\times2\times2\times2\times5\times5$		A1	Dep on M1 oe eg 25×52
						Total 6 marks

13	a	e.g. $d - g = 2ac$ $\frac{d}{2c} = \frac{g}{2c} + a$			M1	for a correct first step e.g. subtract g from both sides **OR** divide all terms by 2 **OR** divide all terms by c **OR** divide all terms by $2c$
			$a = \frac{d-g}{2c}$	2	A1	oe
	b		$3f(3e-4)$	2	B2	(B1 for $3(3ef-4f)$ or $f(9e-12)$ or $3f(ke-4)$ or $3f(3e-m)$ where $k \neq 0$ and $m \neq 0$)
	c	$x^2 - 5x + 2x - 10$			M1	for any 3 correct terms **or** for 4 out of 4 correct terms ignoring signs **or** $x^2 - 3x\ldots$ **or** for $\ldots -3x - 10$
			$x^2 - 3x - 10$	2	A1	
	d	$\frac{n^{11}}{n^5}$ **OR** $n^{-1} \times n^7$ **OR** $n^4 \times n^2$ **OR** $n^4 \times n^7 \times n^{-5}$ **OR** $n^{"11"} \div n^5 = n^{("11"-5)}$			M1	for simplifying two terms
			n^6	2	A1	
						Total 8 marks

14 (a)			$3e^2 - 5e$	1	B1
(b)			$5(7 + f)$	1	B1
(c)			$64p^3q^6$	2	B2 B1 for 2 correct parts of the product
					Total 4 marks

15		−1, 0, 1, 2, 3, 4	2	B2 B1 for $-2, -1, 0, 1, 2, 3, 4$ or $-1, 0, 1, 2, 3$
				Total 2 marks

16 a		Rotation		B1
		(0, 0)		B1 or *O* or origin
		90° clockwise	3	B1 NB award no marks if more than one transformation is described
b		Shape **R** in correct position	2	B2 Vertices at (−4, 1) (−4, 4) (−5, 4) (−5, 2) (−6, 2) (−6, 1) B1 for a correct reflection in the line $x = k$ where $k \neq -1$ **OR** at least 4 vertices in the correct position
				Total 5 marks

17	e.g. $\frac{16}{5}$ **and** $\frac{21}{8}$ oe			M1	both fractions expressed as improper fractions
	e.g. $\frac{\cancel{16}^{2}}{5}\times\frac{21}{\cancel{8}^{1}}$ **OR** $\frac{336}{40}$ oe			M1	correct cancelling **OR** multiplication of numerators and denominators without cancelling
	e.g. $\frac{16}{5}\times\frac{21}{8}=\frac{336}{40}=\frac{42}{5}=8\frac{2}{5}$ **or** $\frac{16}{5}\times\frac{21}{8}=\frac{336}{40}=8\frac{16}{40}=8\frac{2}{5}$ **or** $\frac{\cancel{16}^{2}}{5}\times\frac{21}{\cancel{8}^{1}}=\frac{42}{5}=8\frac{2}{5}$ **or** candidate clearly shows that in the question, the result of $8\frac{2}{5}=\frac{42}{5}$ and that their answer becomes $\frac{42}{5}$	shown	3	A1	Dep on M2 for conclusion to $8\frac{2}{5}$ from correct working – either sight of the result of the multiplication e.g. $\frac{336}{40}$ must be seen or correct cancelling prior to the multiplication to $\frac{42}{5}$ NB: use of decimals scores no marks
					Total 3 marks

18	(adding) $10x = -5$ or $21x + 35y = 42$ $21x - 15y = -33$ then $50y = 75$		3	M1	Correct method to eliminate x or y: coefficients of x or y the same **and** correct operator to eliminate selected variable or correct substitution for x or y into 2nd equation
		$x = -0.5$ oe $y = 1.5$ oe		A1 A1	Both A marks dep on M1
					Total 3 marks

19	$(x \pm 9)(x \pm 4)$	$\frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times 1 \times (-36)}}{2 \times 1}$ **or** $\frac{5 \pm \sqrt{25 + 144}}{2}$			M1	**or** $(x + a)(x + b)$ where $ab = -36$ **or** $a + b = -5$ **OR** correct substitution into quadratic formula (condone one sign error in a, b or c) (if + rather than ± shown then award M1 only unless recovered with answers)
	$(x - 9)(x + 4)$	$\frac{5 \pm \sqrt{169}}{2}$ **or** $\frac{5 \pm 13}{2}$			M1	**or** $\frac{5 \pm \sqrt{169}}{2}$ **or** $\frac{5 \pm 13}{2}$
			9, −4	3	A1	dep on at least M1
						Total 3 marks

Qn	Paper	Question	Skill tested	Mean score	Max score	Mean %	ALL	5	4	3	2	1
1	**1FR**	Q05	Graphical representation of data	3.70	4	93	3.70	3.96	3.74	3.75	3.58	3.12
2	**1FR**	Q02	Statistical measures	4.36	5	87	4.36	4.74	4.57	4.23	3.80	4.13
3	**2FR**	Q04	Fractions and decimals	4.39	5	88	4.39	4.84	4.52	4.35	3.89	3.00
4	**1FR**	Q05	Representation of data	1.77	2	89	1.77	1.95	1.92	1.85	1.77	1.28
5	**1FR**	Q01	Integers	2.51	3	84	2.51	2.76	2.56	2.51	2.27	1.87
6	**1FR**	Q11	Graphs	2.06	3	69	2.06	2.91	2.48	1.94	0.88	0.38
7	**1FR**	Q06	Expressions and formulae	5.14	7	73	5.14	6.39	5.73	4.84	3.69	2.38
8	**2FR**	Q07	Graphs	2.97	4	74	2.97	3.54	3.18	2.81	2.44	1.33
9	**2FR**	Q01	Powers and roots	3.60	5	72	3.60	4.42	3.92	3.38	2.56	1.16
10	**1FR**	Q03	3D shapes and volume	2.91	4	73	2.91	3.36	3.12	2.88	2.39	1.38
11	**2FR**	Q02	Statistical measures	2.64	4	66	2.64	2.93	2.81	2.42	2.37	2.51
12	**2FR**	Q12	Powers and roots	3.72	6	62	3.72	5.34	4.19	3.05	2.14	1.16
13	**1FR**	Q16	Algebraic manipulation	4.24	8	53	4.24	7.15	5.10	3.06	1.31	1.26
14	**2FR**	Q18	Algebraic manipulation	2.03	4	51	2.03	3.19	2.30	1.59	0.81	0.17
15	**2FR**	Q25a	Inequalities	0.97	2	49	0.97	1.59	1.06	0.70	0.44	0.00
16	**1FR**	Q13	Transformation geometry	2.10	5	42	2.10	3.43	2.46	1.56	1.00	0.38
17	**1FR**	Q15	Fractions	1.26	3	42	1.26	2.28	1.30	1.06	0.23	0.38
18	**2FR**	Q21	Simultaneous linear equations	1.12	3	37	1.12	2.46	1.21	0.51	0.07	0.00
19	**1FR**	Q20	Quadratic equations	0.76	3	25	0.76	1.67	0.93	0.26	0.08	0.12
				52.25	**80**	**65**	**52.25**	**68.91**	**57.10**	**46.75**	**35.72**	**26.01**

Suggested grade boundaries

Grade	5	4	3	2	1
Mark	63	52	41	31	20