

This test is divided into non-calculator (30 marks/minutes) and calculator (20 marks/minutes) sections which can be delivered separately.


The following marks are awarded for each question.

B	Unconditional accuracy mark
M	Method mark – the correct method must be shown but there may be an arithmetic error; the sight of the value given in brackets implies the award of the method mark
A	Accuracy mark – unless the question specifies that working must be shown then the sight of the correct answer implies the award of full marks (unless the answer clearly comes from incorrect working)
C	Communication mark
P	Process mark to show correct process for problem solving. Any other process of a similar standard to achieve an accurate result is acceptable to achieve this mark
FT	Incorrect values may be followed through from one step to the next provided that the correct method is seen in each step and the only errors are arithmetic. This is shown in mark schemes by putting a number in inverted commas
OE	Or equivalent answer mark


Non-Calculator			
Q	Answer	Mark	Comment
1	10	M1	correct numerator of 10×5
		M1	correct denominator of $8 - 3$
		A1	
2a	5^9	B1	
2b	7^{24}	B1	
2c	32	M1	2^{7+3-5} or an answer of 2^5
		A1	
3	8.3 and 8.4	P1	for testing values between 8 and 9 inclusive (could be implied by answer)
		P1	for 8.2 and 8.3 or 8.4 and 8.5 or $8.3^2 = 68.89$ or $8.4^2 = 70.56$
		A1	

4	$m = 3$ and $n = 7$	B1	for $2^3 \times 7$ or $2 \times 2 \times 2 \times 7$ or $m = 3$ or $n = 7$
		A1	
5a	2.0272	B1	
5b	72.4	B1	
5c	362	M1	for $20272 \div 28 \div 2$ or $724 \div 2$
		A1	
6	18 and 24	P1	for any attempt to list any four factors of 72 less than 50 or lists any four multiples of 6 less than 50 for two numbers with HCF of 6 or LCM of 72
		P1	
		A1	
7	$\frac{5}{2}$ OE	P1	for $\sqrt{8} = 2^{\frac{3}{2}}$ or $4 \times 8 = 2^{2n}$
		A1	
8	$5(.0) \times 10^5$	P1	for 0.5×10^6 or 0.000 05
		A1	
9	$\frac{8}{27}$	P1	for first step, e.g. $\left(\frac{3}{2}\right)^{-3}$ or $\left(\frac{4}{9}\right)^{\frac{3}{2}}$ or $\left(\frac{729}{64}\right)^{-\frac{1}{2}}$ for two steps, e.g. $\left(\frac{2}{3}\right)^3$ or $\left(\frac{64}{729}\right)^{\frac{1}{2}}$
		P1	
		A1	

10	Proof	P1	for $\sqrt{27} \times (\sqrt{5} + \sqrt{45}) - \sqrt{3} \times \sqrt{5}$ OE or for $\frac{(\sqrt{5} \times \sqrt{3})}{\sqrt{27}(\sqrt{5} + \sqrt{45})}$
		P1	for $\sqrt{27} = 3\sqrt{3}$ or $\sqrt{45} = 3\sqrt{5}$ OE
		P1	for $\frac{12\sqrt{3}\sqrt{5} - \sqrt{3}\sqrt{5}}{12\sqrt{3}\sqrt{5}}$ (could have $\sqrt{15}$ \times instead of $\sqrt{3} \sqrt{5}$) or for complete method to show shaded area cancels down to $\frac{1}{12}$
		C1	complete proof to $\frac{11}{12}$

 Calculator			
11	0.12 and 0.6	P1	for any two decimals whose product is 0.072
		A1	
12a	SF, SM, SV, HF, HM, HV, AF, AM, AV	B1	
12b	11	P1	for 5×4 or lists all 20
		A1	
13a	1.969	B1	for 1.97 or 1.9691....
		B1	
13b	1.5	B1	accept $\frac{3}{2}$ or $1\frac{1}{2}$
14	reciprocal of 2.7	P1	for two of: $1 \div 2.7 (= 0.370...)$; $0.371...$; $0.72 \times 0.72 \times 0.72 (= 0.373...)$
		C1	
15a	$2^6 \times 3^5$	B1	
15b	$2^7 \times 3^8 \times 7 \times 5$	P1	for either 2^7 or 3^8 in a product of factors
16	£26.03	P1	attempt to find LCM by, e.g., lists of multiples, or summing of 105s and summing of 84s, with at least three numbers in each list
		A1	identify 420 (as LCM)
		P1	for "420" \div 105 or 4 or "420" \div 84 or 5
		P1	"4" \times 1.32 (= 5.28) + "5" \times 4.15 (= 20.75)
		A1	
17a	3.48×10^{-2}	B1	
17b	29 000 000 000	B1	

Non-Calculator			
Question	Topic	Step	Marks
1	Place value	5th	3
2a	Use positive integer powers	7th	1
2b	Use positive integer powers	8th	1
2c	Use positive integer powers	7th	2
3	Calculate with roots	7th	3
4	Use positive integer powers	5th	2
5a	Place value	6th	1
5b	Place value	6th	1
5c	Place value	6th	2
6	HCF and LCM	7th	3
7	Fractional indices	10th	2
8	Standard form	9th	2
9	Fractional indices	11th	3
10	Calculate with surds	11th	4

 Calculator			
11	Apply the four operations to decimals	5th	2
12a	Apply systematic listing strategies	5th	1
12b	Use of product rule for counting	10th	2
13a	Calculate with roots, and with integer indices & Place value	6th	2
13b	Calculate with roots	6th	1
14	Reciprocals, squares, cubes	7th	2
15a	HCF	7th	1
15b	LCM	7th	2
16	Apply the four operations	6th	5
17a	Standard form	8th	1
17b	Standard form	8th	1

Marks to Steps conversion table

The table below converts marks to a step on the Pearson progression scale. For more information on the progression service please see the [progression website](#).

Mark boundary	Step
0	U
1–2	3rd Step
3–7	4th Step
8–14	5th Step
15–22	6th Step
23–29	7th Step
30–35	8th Step
36–40	9th Step
41–44	10th Step
45–50	11th Step