1 Find the value of 3^{-1}

(1 mark)

2 Find the value of $\left(\frac{4}{5}\right)^{-1}$

(1 mark)

3 Find the value of 5^{-1}

(1 mark)

4 Find the reciprocal of 3

(1 mark)

5 Find the value of $100^{\frac{1}{2}}$

(1 mark)

6 Find the value of $64^{\frac{1}{2}}$

(1 mark)

7 Find the value of $49^{\frac{1}{2}}$

(1 mark)

8 Find the value of $81^{\frac{1}{2}}$

(1 mark)

9 Find the value of $36^{-\frac{1}{2}}$

(1 mark)

10 Find the value of $64^{\frac{1}{3}}$

Mock Paper 2& 3 Feedback lesson

Retrieval practice

The rule to get from one term to the next

$x_{n+1} = 2x_n + 3$

If $x_1 = 5$, work out the value of x_4.

Learning Objectives:

Review of assessment for non calculator papers

KO (P26) **Write in full sentences**

1.

6-fractional-and-negative-indicesans.pdf

The rule to get from one term to the next in a sequence is

$x_{n+1} = 2x_n + 3$

If $x_1 = 5$, work out the value of x_4.

$n = 1$,

$x_2 = 2x_1 + 3$

$x_2 = 2 \times 5 + 3$

$x_2 = 13$

$n = 2$,

$x_3 = 2x_2 + 3$

$x_3 = 2 \times 13 + 3$

$x_3 = 29$

$n = 3$,

$x_4 = 2x_3 + 3$

$x_4 = 2 \times 29 + 3$

$x_4 = 61$

Answer: $x_4 =$ 61

H	
0	U
36	3-
42	3
48	3+
53	4-
69	4
78	4+
87	5-
102	5
111	5+
121	6-
132	6
144	6+
156	7-
168	7
174	7+
186	8-
195	8
201	8+
217	9-
225	9
231	9+

Operation 30

In most cases 30 marks will allow you to secure the next grade up.

Some of these marks can come from content you have not yet covered, but not all.

Other marks need to come from topics you have not yet mastered. This is the part where revision is important.

Aim for at least 15 more mark between now and March mocks. Then 15 more between then and the exams.

Only 5 marks per paper each time!

Take QLA’s and place one copy home for each and stick one of each into your book.

- Stick in your feedback sheet

Paper 2 – Most of the marks will be gained through topics we will cover in this unit

Qu 22. Circle graphs with tangents and translating graphs (3 marks on paper 2 and paper 3 was 4 marks)

Qu21. Solving quadratic inequalities (2 marks)

Qu9 indices calculations

9 $3x^{-1}(4x - x^3) = a + bx^n$ for all the values of x that are not zero.

Find the value of a, the value of b and the value of n.

9	12, – 3, 2	B2	all correct	$12 - 3x^2$ seen in working space gets B2 unless contradicted
	0	(B1	for one or two correct)	May be seen in an expression of the correct form, eg $a + bx^n$

$a =$ .....

$b =$ .....

$n =$ .....

(Total for Question 9 is 2 marks)

Question 1

Solve

$16^{\frac{1}{4}} \times 8^{x} = 32$

Question 2

Solve

$8^{\frac{1}{3}} \times 8^{x} = 64$

Question 3

Solve

$4^{\frac{1}{2}} \times 2^{x} = 4$

Question 4

Solve

$8^{\frac{1}{3}} \times 4^{x} = 32$

Question 1

Solve

$16^{\frac{1}{4}} \times 8^{x} = 32$

$x = \frac{4}{3}$

Question 2

Solve

$8^{\frac{1}{3}} \times 8^{x} = 64$

$x = \frac{5}{3}$

Question 3

Solve

$4^{\frac{1}{2}} \times 2^{x} = 4$

$x = 1$

Question 4

Solve

$8^{\frac{1}{3}} \times 4^{x} = 32$

$x = 2$

Question 1

Solve

$32^{\frac{1}{5}} \times 16^{x} = 4$

Question 2

Solve

$16^{\frac{3}{4}} \times 4^{x} = 4$

Question 3

Solve

$32^{\frac{1}{5}} \times 4^{x} = 64$

Question 4

Solve

$32^{\frac{3}{5}} \times 16^{x} = 16$

Question 1

Solve

$32^{\frac{1}{5}} \times 16^{x} = 4$

$x = \frac{1}{4}$

Question 2

Solve

$16^{\frac{3}{4}} \times 4^{x} = 4$

$x = -\frac{1}{2}$

Question 3

Solve

$32^{\frac{1}{5}} \times 4^{x} = 64$

$x = \frac{5}{2}$

Question 4

Solve

$32^{\frac{3}{5}} \times 16^{x} = 16$

$x = \frac{1}{4}$

Paper 3 – most of you have already found 5 marks you can now gain 3 more

- The next question will allow you secure an additional 3 marks on paper 3

19 There are some sheets of paper in a pile.

The height of the pile is 10.4 cm, correct to the nearest mm.

The thickness of each sheet of paper is 0.17 mm, correct to 2 significant figures.

Calculate the upper bound for the number of sheets of paper in the pile.
You must show all your working.

Question	Answer	Mark	Mark scheme	Additional guidance
19	633	B1	for stating any correct bound, eg 10.35 or 10.45 or 103.5 or 104.5 or 0.165 or 0.175 or 0.0165 or 0.0175	Accept $10.44\dot{9}$ or 10.4499(9…) for 10.45 Accept $0.174\dot{9}$ or 0.17499(9…) for 0.175
		P1	for process to find the upper bound, eg [UB of height] ÷ [LB of thickness] or 104.5 ÷ 0.165 or 10.45 ÷ 0.0165 **or** eg [UB of height] ÷ [LB of thickness] × 10 or 10.45 ÷ 0.165 × 10	104 < [UB of height] ≤ 104.5 and 0.165 ≤ [LB of thickness] < 0.17 **or** 10.4 < [UB of height] ≤ 10.45 and 0.0165 ≤ [LB of thickness] < 0.017 **or** 10.4 < [UB of height] ≤ 10.45 and 0.165 ≤ [LB of thickness] < 0.17
		A1	(dep on all previous marks) for an answer of 633 or 633(.33…) clearly coming from working with correct values eg 104.5 ÷ 0.165 = 633	Condone 630 from a correct calculation If correct answer is seen and then incorrectly rounded award full marks Award 0 marks for a correct answer with no (or incorrect) supportive working

1 A rectangle has a length of 21cm, to the nearest cm, and a width of 5.3cm, to the nearest mm.

a) Work out the upper bound for the perimeter of the rectangle. (2)

b) Work out the lower bound for the area of the rectangle. (2)

(Total for question 1 is 4 marks)

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2 A circle has a radius of 5cm, to the nearest cm.

a) Work out the lower bound for the circumference of the circle.
Give your answer in terms of π. (2)

b) Work out the upper bound for the area of the circle.
Give your answer in terms of π. (2)

(Total for question 2 is 4 marks)

---

3 A rectangular field has a length of 105 metres, to the nearest 5 metres, and a width of 53 metres, to the nearest metre.

a) Work out the lower bound for the perimeter of the field. (2)

b) Work out the upper bound for the area of the field (2)

(Total for question 3 is 4 marks)

---

4 A circle has a radius of 5.36cm, correct to 2 decimal places.

a) Work out the lower bound for the circumference of the circle.
Give your answer to 2 decimal places. (2)

b) Work out the upper bound for the area of the circle.
Give your answer to 3 significant figures. (2)

(Total for question 4 is 4 marks)

7-boundsans.pdf

17 $g(x) = 1 - 3x$ $h(x) = 2x^2 - 1$

Show that $3gh(x) + hg(x) = 0$ has just one solution for x.

17	Shown	M1	for method to finding gh(x), eg gh(x) = $1 - 3(2x^2 - 1)$	$= 1 - 6x^2 + 3$ $= 4 - 6x^2$
		M1	for method to find hg(x), eg hg(x) = $2(1 - 3x)^2 - 1$	$= 2(1 - 3x - 3x + 9x^2) - 1$ $= 2 - 12x + 18x^2 - 1$ $= 1 - 12x + 18x^2$

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
		M1	(dep M2) for method to find $3gh(x) + hg(x)$ eg $3(1 - 3(2x^2 - 1)) + 2(1 - 3x)^2 - 1 (= 0)$	Expressions for gh(x) and hg(x) may have been incorrectly expanded and simplified
		M1	for expanding all brackets as far as at least $3 - 18x^2 + 9 + 2 - 12x + 18x^2 - 1 (= 0)$	Need not be fully simplified but must be correct
		C1	for reducing to a linear equation eg $13 - 12x = 0$ and stating that this gives just one solution or stating $x = \frac{13}{12}$ oe	

(Total for Question 17 is 5 marks)