ADA PINPOINT TOPIC PACKS

(1)Fractional and Negative Indices (10 Qns)
(2)Simple Index Form (0 Qns)
(3)Index Notation (5 Qns)
(4)Equations and Indices (1 Qns)

50_to_100_Percent_Pinpoint_AI_Pack

Time Allocation = 35mins , Max = 31 Marks

Calculated Grade Boundaries:

Grade	Marks
5-	3
5	5
5+	7
6-	9
6	11
6+	13
7-	15
7	17
7+	19
8-	21
8	23
8+	25
9-	27
9	29
9+	32

Question 1 (AO1): (No Calc) 45% of students got this right (5 marks)

11. (*a*) Write down the value of 25^0

.....

(1)

(*b*) Write down the value of $49^{-\frac{1}{2}}$

.....

(1)

(*c*) Write as a power of 2 $\dfrac{4\times 8}{16^3}$

.....

(3)

(Total 5 marks)

Question 2 (AO1): (No Calc) 44% of students got this right (1 marks)

1 (*c*) Write down the value of 3^{-2}

Question 3 (AO2): (No Calc) 38% of students got this right (2 marks)

18. (a) Write the following five numbers in order of size.
Start with the smallest number.

2^0 $\sqrt{2}$ $\frac{1}{2}$ 2^{-2} $\frac{1}{\sqrt{2}}$

.....

(2)

Question 4 (AO1): (No Calc) 34% of students got this right (4 marks)

12. $2^k = 16$

(c) Write down the value of k.

.....

(1)

(d) Solve $8^5 = 2^{2m+3}$

.....

(3)

(Total 6 marks)

Question 5 (AO2): (No Calc) 28% of students got this right (5 marks)

15 (*a*) Find the value of $\sqrt[3]{8\times10^6}$

(*b*) Find the value of $144^{\frac{1}{2}} \times 64^{-\frac{1}{3}}$

(*c*) Solve $3^{2x} = \frac{1}{81}$

Question 6 (AO1): (No Calc) 24% of students got this right (1 marks)

10 Find the value of $16^{-\frac{3}{4}}$

.....

(Total for Question 10 is 1 mark)

Question 7 (AO1): (No Calc) 22% of students got this right (2 marks)

15. (b) Find the value of $\left(\frac{216}{1000}\right)^{-\frac{2}{3}}$

.....

(2)

(Total for Question 15 is 4 marks)

Question 8 (AO2): 15% of students got this right (3 marks)

16. Given that $\left(2^{\frac{1}{2}}\right)^n = \frac{2^x}{8^y}$

express n in terms of x and y.

.....

(Total 3 marks)

Question 9 (AO3): 14% of students got this right (3 marks)

18 $16^{\frac{1}{5}} \times 2^x = 8^{\frac{3}{4}}$

Work out the exact value of x.

(Total for Question 18 is 3 marks)

Question 10 (AO3): (No Calc) 13% of students got this right (3 marks)

22. (*a*) Simplify fully $(3e)^0$

.....

(1)

(*b*) Simplify $\left(\frac{64x^6}{25y^2}\right)^{-\frac{1}{2}}$

.....

(2)

Question 11 (AO3): 7% of students got this right (2 marks)

14 Given that $2^{-n} = 0.25$

find the value of $(2^3)^n$

.....

(Total for Question 14 is 2 marks)

Answers to Qn 1 (AO1): (No Calc) 45% of students got this right

11.	(*a*)		1	1	B1 cao
	(*b*)		$\frac{1}{7}$	1	B1 for $\frac{1}{7}$ (condone $\pm\frac{1}{7}$)
	(*c*)	$\frac{2^3 \div 2^3}{2^{4^3}} = \frac{2^5}{2^{12}}$	2^{-7}	3	M1 for writing one of the numbers correctly as a power of 2 M1 for $2^{'2'} \times 2^{'3'} = 2^{'2'+'3'}\left(= 2^5\right)$ or $\left(2^{'4'}\right)^3 = 2^{'4'\times 3}\left(= 2^{12}\right)$ or $\frac{2^{'5'}}{2^{'12'}} = 2^{'5'-'12'}$ A1 for 2^{-7} or $\frac{1}{2^{-7}}$
		OR $\frac{2\times 16}{16\times 16\times 16} =$ $\frac{2}{16\times 16} = \frac{2}{2^4\times 2^4} = \frac{2}{2^8}$			**OR** B1 for $\frac{1}{16^2}$ or an equivalent fraction with a numerator of 2 M1 for $2^{'4'} \times 2^{'4'} = 2^{'4'+'4'}\left(= 2^8\right)$ or $\frac{2^{'1'}}{2^{'8'}} = 2^{'1'-'8'}$ A1 for 2^{-7} or $\frac{1}{2^7}$ [SC: B1 for an answer of $\frac{1}{128}$ if M0 scored]

Answers to Qn 2 (AO1): (No Calc) 44% of students got this right

Question	Working	Answer	Mark	Notes
1 (c)		$\frac{1}{9}$	B1	for $\frac{1}{9}$ (or 0.11…)

Answers to Qn 3 (AO2): (No Calc) 38% of students got this right

Question		Working	Answer	Mark	Notes
18.	(a)		$2^{-2}, \frac{1}{2}, \frac{1}{\sqrt{2}}, 2^{0}, \sqrt{2}$	2	M1 for changing to powers of 2, e.g. sight of $2^{0.5}$ or 2^{-1} or $2^{-0.5}$ A1 for correct order (accept alternative equivalent forms, e.g. all powers of 2) (SCB1 if M0 scored, for all in correct reverse order)

Answers to Qn 4 (AO1): (No Calc) 34% of students got this right

Question		Working	Answer	Mark	Notes
12	(c)		4	1	B1 cao
	(d)		6	3	M1 for using $8 = 2^3$ M1 for deriving a correct equation in m A1 cao

Answers to Qn 5 (AO2): (No Calc) 28% of students got this right

Paper 1MA1: 1H			
Question	**Working**	**Answer**	**Notes**
15 a		200	B1 200 or 2×10^2
b		3	B1 12 and $\frac{1}{4}$ A1 3 cao
c		-2	M1 $81 = 3^4$ or $\frac{1}{81} = 3^{-4}$ A1 cao

Answers to Qn 6 (AO1): (No Calc) 24% of students got this right

10 Find the value of $16^{-\frac{3}{4}}$

$$16^{-\frac{3}{4}} = \left(\frac{1}{16}\right)^{\frac{3}{4}} = \left(\frac{1}{\sqrt[4]{16}}\right)^{3} = \left(\frac{1}{2}\right)^{3} = \frac{1}{8}$$

..... $1/8$.....

(Total for Question 10 is 1 mark)

Answers to Qn 7 (AO1): (No Calc) 22% of students got this right

15	(b)		$\frac{25}{9}$	M1 A1	shows understanding of notation by working out one step, e.g. reciprocal or cube root (to both numbers). oe

Answers to Qn 8 (AO2): 15% of students got this right

16.		$2^{\frac{n}{2}} = \frac{2^x}{(2^3)^y}$ $2^{\frac{n}{2}} = 2^{x-3y}$	 $n = 2x - 6y$	3	M1 for writing 8 as 2^3 or $2^{\frac{n}{2}}$ M1 for 2^{x-3y} or $\frac{1}{2}n = x - 3y$ A1 for $n = 2(x - 3y)$ or $n = (x - 3y) \div 0.5$

Answers to Qn 9 (AO3): 14% of students got this right

Question 18 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$16 = 2^4$ or $8 = 2^3$	P1	This mark is given for converting to a common base with at least one correct conversion
	$(2^4)^{\frac{1}{5}} \times 2^x = (2^3)^{\frac{3}{4}}$ $2^{\frac{4}{5}+x} = 2^{\frac{9}{4}}$	P1	This mark is given for a process to use of index laws to derive an equation
	$\frac{4}{5} + x = \frac{9}{4}$ $x = \frac{29}{20} = 1.45$	A1	This mark is given for the correct answer only

Answers to Qn 10 (AO3): (No Calc) 13% of students got this right

22 (a) Simplify fully $(3e)^0$

1

(1)

(b) Simplify fully $\left(\frac{64x^6}{25y^2}\right)^{-\frac{1}{2}}$

$\left(\frac{25y^2}{64x^6}\right)^{1/2}$

$\frac{5y}{8x^3}$

Answers to Qn 11 (AO3): 7% of students got this right

14 Given that $2^{-n} = 0.25$

find the value of $(2^3)^n$

$$2^n = \frac{1}{0.25} = 4$$

So $(2^3)^n = (2^n)^3 = (4)^3 = 64$

.....

(Total for Question 14 is 2 marks)
