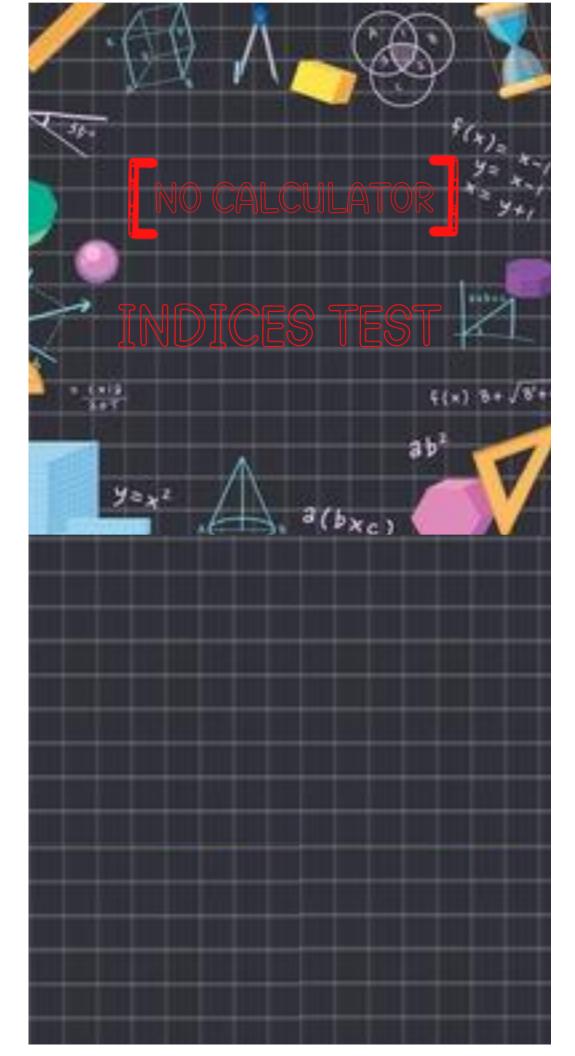
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1. Simplify  $\left(4h^{\frac{2}{3}}\right)^3$ 

(2 marks)

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 $2. p^m = \frac{1}{p \times \sqrt[3]{p^2}}$ 

Find the value of m.

(3 marks)

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3.	(a)	Simplify $p^3 \times p^5$		
		Simplify $(4ab^2)^3$		(1)
	(c)	Simplify $\frac{16m^7n^3}{4m^3n}$		(2)
				(2)

(5 marks)

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4.	(a) Simplify $5c^2d^3 \times 2d$	
	(b) Write $64 \times 4^5$ as a power of 4	(1)
	(c) Simplify $p^3 \times (p^5)^2$	(2)
		(2)

(5 marks)

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**5.**  $(3+\sqrt{c})(2\sqrt{c}-3)=1+k\sqrt{c}$ 

(3 marks)

where c and k are prime numbers.

Find the value of *c* and the value of *k*.

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6.  $m = 8 \times 10^{9n}$  where n is an integer.

Express  $m^{-\frac{1}{3}}$  in standard form.

Give your answer, in terms of n, as simply as possible.

(3 marks)

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7. Solve 
$$3^{2x} = \frac{1}{81}$$

(3 marks)

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**8.** 
$$3^a = \frac{1}{9}$$
  $3^b = 9\sqrt{3}$   $3^c = \frac{1}{\sqrt{3}}$  (5 marks) Work out the value of  $a + b + c$ 

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9.

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

Work out the exact value of x.

(6 marks)