

**INDICES (ADVANCED) – PRACTICE QUESTIONS
NON-CALCULATOR**



1.
Find x.

$$2^{2x-3} = 8$$

2.
Find x.

$$3^{3x} \times 3^x = 81$$

3.
Find x.

$$2^x \times 2^{x+1} = 32$$

4.
Find x.

$$4^{x-1} = \frac{1}{64}$$

5.
Find x.

$$5^{3x+5} = \frac{1}{25}$$

6.
Find x.

$$2^{4x-1} = \frac{1}{16}$$

7.
Find x.

$$\frac{3^x}{9} = 3^{5x}$$

8.
Find x.

$$\frac{2^{3x+5}}{8} = 2^{2x}$$

9.

Find x.

$$\frac{8^{2x+1}}{2^x} = 4$$

10.

Find x.

$$\frac{9^{x+2}}{3^x} = 27$$

11.

Find x.

$$\frac{16^{3x-3}}{64^x} = 4^{x+1}$$

12.
Find x.

$$\sqrt{5} \times 25^x = 125$$

13.
Find x.

$$\frac{8^{2x+1}}{\sqrt{2}} = 4^x$$

14.
Find x.

$$3^{2x} \times \sqrt{27} = 81$$

15.
Find x.

$$\frac{2^{2x}}{\sqrt{32}} = \sqrt{8}$$

16.
Solve

$$\frac{64^{x+1}}{4^x} = 16^{2x-1}$$

17.
Solve

$$\frac{\sqrt{125}}{5^{3x}} = 25^{x-1}$$

18.
Solve

$$\frac{100^{x-1}}{\sqrt{1000}} = 1$$

19.
Solve

$$9^{x+1} = 3\sqrt{27}$$

20.
Solve

$$4^{2x-1} = 2\sqrt{32}$$

21.
Solve

$$\frac{25^{2x-1}}{5^x} = 25\sqrt{5}$$

22.

$81^a \times 9^{2b}$ can be written in the form 3^Y .

Find an equation for Y in terms of a and b.

23.

$\sqrt{10^x} \times 1000^y$ can be written in the form 10^z .

Find an equation for x in terms of y and z.

24.

$$6^r = \frac{1}{36}$$

$$6^t = \sqrt[4]{36}$$

$$6^u = \sqrt{216}$$

Work out the value of $r + t + u$.