Laws of Indices

a^b → Power

Indice a^b Base values → 2, 3, 5, 7

↓
Base
Value

① Multiplication

$$a^m \times a^n = a^{m+n}$$ Add the powers

② Division

$$\frac{a^m}{a^n} = a^{m-n}$$ Subtract the bottom power from
the top power

③ $$(a^m)^n = a^{mn}$$ multiply the powers

④ $$a^0 = 1$$

⑤ Fractional indices

Roots → Powers

$\sqrt{} = \frac{1}{2}$

$\sqrt[3]{} = \frac{1}{3}$

$\sqrt[4]{} = \frac{1}{4}$

⑥ Negative Powers

$$a^{-n} = \frac{1}{a^n}$$ make reciprical

Equations with indices

Method :

1) You must write all the numbers in the equation as
the same base value i.e   2, 3, 5, 7

2) Use rules of indices to tidy up the equation

3) Cancel the base values and solve to find
the value of x

Eg 1)   Solve for   x

$$2^x = 8$$

$$2^x = (2^3)$$

$x = 3$ $2^3 = 8$ ✓

$$x = (2^3)$$

$$x = 3 \qquad 2^3 = 8 \checkmark$$

Eg2) Solve for x

$$25^x = 125$$

$$\downarrow \qquad \downarrow$$

$$(5^2)^x = (5^3)$$

$$5^{2x} = 5^3$$

$$\div 2 \;\bigg|\; \begin{array}{c} 2x = 3 \\ x = 3/2 \end{array} \;\bigg|\; \div 2$$

Eg3) $\quad 2^x = \dfrac{1}{4}$

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

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

$$x = -2$$

C/W → H/W

Pg 41

Q 4, 8, 12, 16, 20

T&T3 2.8

PDF
T&T3
2.8.pptx

PROJECT MATHS

Text & Tests

Leaving **3** Certificate

chapter

Algebra 2: Quadratic Equations **2**

Section 2.8 **Equations involving indices** ————————

Exercise 2.8

1. Express each of the following in the form 2^k, where k is an integer.

(i) 8   (ii) 16   (iii) $\frac{1}{4}$ (iv) $\frac{1}{8}$ (v) $\frac{1}{32}$