

ALGEBRA (Q 2 & 3, PAPER 1)

LESSON NO. 5: INDEX EQUATIONS

2007

2 (b) (ii) Find the value of x for which $2^{x+3} = 4^x$.

2004

2 (c) (i) Evaluate $8^{\frac{1}{3}}$.

(ii) Express $4^{\frac{1}{4}}$ in the form 2^k , $k \in \mathbf{Q}$.

(iii) Solve for x the equation

$$(8^{\frac{1}{3}})(4^{\frac{1}{4}}) = 2^{5-x}.$$

2003

2 (b) (i) Evaluate $9^{\frac{1}{2}}$.

(ii) Express $\sqrt{8}$ in the form 2^k , $k \in \mathbf{Q}$.

(iii) Solve for x the equation $25^x = 5^{6-x}$.

2001

2 (c) Solve each of the following equations for p

(i) $9^p = \frac{1}{\sqrt{3}}$

(ii) $2^{3p-7} = 2^6 - 2^5$.

2000

2 (c) Write as a power of 3

(i) 243

(ii) $\sqrt{27}$.

Hence, solve for x the equation $\sqrt{3}(3^x) = \left(\frac{243}{\sqrt{27}}\right)^2$.

1999

2 (b) Write as a power of 2

(i) 8

(ii) $8^{\frac{4}{3}}$.

Solve for x the equation

$$8^{\frac{4}{3}} = \frac{2^{5x-4}}{\sqrt{2}}.$$

1998

2 (c) (i) Write $\sqrt{125}$ as a power of 5.

(ii) Solve for x the equation

$$\frac{5^{2x+1}}{\sqrt{5}} = \left(\frac{1}{\sqrt{125}}\right)^3.$$

1996

2 (b) Write as a power of 2

(i) 16

(ii) $\sqrt{8}$.

Solve for x the equation

$$2^{2x-1} = \left(\frac{16}{\sqrt{8}}\right)^3.$$

ANSWERS

2007 2 (b) (ii) $x = 3$

2004 2 (c) (i) 2 (ii) $2^{\frac{1}{2}}$ (iii) $x = \frac{7}{2}$

2003 2 (b) (i) 3 (ii) $2^{\frac{3}{2}}$ (iii) $x = 2$

2001 2 (c) (i) $p = -\frac{1}{4}$ (ii) $p = 4$

2000 2 (c) (i) 3^5 (ii) $3^{\frac{3}{2}}$; $x = \frac{13}{2}$

1999 2 (b) (i) 2^3 (ii) 2^4 ; 1.7

1998 2 (c) (i) $5^{\frac{3}{2}}$ (ii) $-\frac{5}{2}$

1996 2 (b) (i) 2^4 (ii) $2^{\frac{3}{2}}$; $x = \frac{17}{4} = 4.25$