1. Find the value of

(i) $36^{\frac{1}{2}}$ ← square root

6

(ii) 3^{-2} ← square and flip

$\frac{1}{9}$

(Total 2 marks)

2. Write down the value of

(a) 7^0 ← anything to the power of zero is 1

1

(1)

(b) 4^{-1} ← flip

$\frac{1}{4}$

(1)

(Total 2 marks)

3. (a) Simplify 2^0

1

(1)

(b) Simplify 5^{-1}

$\frac{1}{5}$

(1)

(Total 2 marks)

4. (a) Write down the value of 2^{-1}

$\frac{1}{2}$

(1)

(b) Write down the value of $64^{\frac{1}{2}}$

8

(1)

(Total 2 marks)

5. Write down the value of

(i) 5°

1

(ii) 4^{-2}

$\frac{1}{16}$

(iii) $100^{\frac{1}{2}}$

10

(Total 3 marks)

6. (a) Write down the value of

(i) 9°

1

(ii) $169^{\frac{1}{2}}$

13

(2)

(b) Work out $64^{\frac{2}{3}}$ ← cube root and square

16

(2)

(Total 4 marks)

7. (a) Find the value of $36^{\frac{1}{2}}$

6

(1)

(b) Find the value of $8^{-\frac{2}{3}}$ ← cube root, square and flip

$\frac{1}{4}$

(2)

(Total 3 marks)

8. Work out

(i) 4^0

1

(ii) 4^{-2}

$\frac{1}{16}$

(iii) $16^{\frac{3}{2}}$

64

(Total 3 marks)

9. Write down the value of

(a) $25^{\frac{1}{2}}$

5

(1)

(b) 9^0

1

(1)

(Total 2 marks)

10. (a) Evaluate

(i) 3^{-2}

$\frac{1}{9}$

(ii) $36^{\frac{1}{2}}$

6

(iii) $27^{\frac{2}{3}}$

9

(iv) $\left(\frac{16}{81}\right)^{-\frac{3}{4}}$

$\frac{27}{8}$

(5)

11. (a) Find the value of

(i) 64°

1

(ii) $64^{\frac{1}{2}}$

8

(iii) $64^{-\frac{2}{3}}$

$\frac{1}{16}$

(4)

(b) $3 \times \sqrt{27} = 3^n$

Find the value of n.

$3^1 \times 3^{\frac{3}{2}} = 3^{\frac{5}{2}}$

$n = \frac{5}{2}$ or 2.5

(2)

(Total 6 marks)

12. (a) Work out $3^6 \div 3^{-7}$ $= 3^{13}$

3^{13}

.....

(1)

(b) Write down the value of $36^{\frac{1}{2}}$

6

.....

(1)

(c) $3^n = \frac{1}{9}$

Find the value of n.

$n =$ -2

.....

(1)

(Total 3 marks)

13. (a) Simplify

(i) $(3x^2y)^3$

$27x^6y^3$

.....

(ii) $(2t^{-3})^{-2}$

$\frac{1}{4}t^6$

.....

(4)

14. $x = 2^p, \quad y = 2^q$

(a) Express in terms of x and/or y,

(i) 2^{p+q}

$2^p \times 2^q$

.....xy.....

(ii) 2^{2q} $2^q \times 2^q$

.....y^2.....

(iii) 2^{p-1}

$2^p \div 2^1$

.....$\frac{x}{2}$.....

(3)

$xy = 32$

and $2xy^2 = 32$

$32 = 2^5$

(b) Find the value of p and the value of q.

$x = 2^p$

$y = 2^q$

$xy = 32$

$2^p \times 2^q = 2^5$

$2^{p+q} = 2^5$

$p + q = 5$

$2xy^2 = 32$

$2^1 \times 2^p \times 2^q \times 2^q = 2^5$

$2^{2q+p+1} = 2^5$

$2q + p + 1 = 5$

$2q + p = 4$

$p + q = 5$

$p + 2q = 4$

$q = -1$

$p = 6$

$p =$ .....6.....

$q =$ .....-1.....

(2)

(Total 5 marks)

16. (a) Write down the value of $8^{\frac{1}{3}}$

2

.....

(1)

$8\sqrt{8}$ be written in the form 8^k

$8^1 \times 8^{\frac{1}{2}} = 8^{\frac{3}{2}}$

(b) Find the value of k.

$k = \frac{3}{2}$

.....

(1)

$8\sqrt{8}$ can also be expressed in the form $m\sqrt{2}$ where m is a positive integer.

(c) Express $8\sqrt{8}$ in the form $m\sqrt{2}$

$\sqrt{8} = \sqrt{4} \times \sqrt{2}$

$= 2\sqrt{2}$

$8(2\sqrt{2})$

$16\sqrt{2}$

.....

(2)

(d) Rationalise the denominator of $\frac{1}{8\sqrt{8}}$

Give your answer in the form $\frac{\sqrt{2}}{p}$ where p is a positive integer.

$\frac{1}{8\sqrt{8}} = \frac{1}{16\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{16 \times 2}$

$\frac{\sqrt{2}}{32}$

.....

(2)

(Total 6 marks)