



1.

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

(2 marks)

2.

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

(3 marks)

Find the value of  $m$ .

3.

(a) Simplify  $p^3 \times p^5$

(b) Simplify  $(4ab^2)^3$

.....  
(1)

(c) Simplify  $\frac{16m^7n^3}{4m^3n}$

.....  
(2)

.....  
(2)

(5 marks)

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)

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

where  $c$  and  $k$  are prime numbers.

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

(3 marks)

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)

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

(3 marks)



8.  $3^a = \frac{1}{9}$        $3^b = 9\sqrt{3}$        $3^c = \frac{1}{\sqrt{3}}$

Work out the value of  $a + b + c$

(5 marks)

9.

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

Work out the exact value of x.

(6 marks)