1 (a) Write down the value of $100^{\frac{1}{2}}$

....

(1)

(b) Find the value of $125^{\frac{2}{3}}$

....

(2)

(Total for Question 1 is 3 marks)

1 (a) Write down the value of $100^{\frac{1}{2}}$

2 $p^3 \times p^x = p^9$

(a) Find the value of x.

$x =$ ....
(1)

$(7^2)^y = 7^{10}$

(b) Find the value of y.

$y =$ ....
(1)

$100^a \times 1000^b$ can be written in the form 10^w

(c) Show that $w = 2a + 3b$

(2)

(Total for Question 2 is 4 marks)

2 $p^3 \times p^x = p^9$

(a) Find the value of x.

3 (a) Find the value of $81^{-\frac{1}{2}}$

....

(2)

(b) Find the value of $\left(\dfrac{64}{125}\right)^{\frac{2}{3}}$

....

(2)

(Total for Question 3 is 4 marks)

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

Work out the exact value of x.

....

(Total for Question 4 is 3 marks)

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

Work out the exact value of x.

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

....

(1)

(b) Write down the value of 23^0

....

(1)

(c) Work out the value of $27^{-\frac{2}{3}}$

....

(2)

(Total for Question 5 is 4 marks)

6 (a) Simplify $m^3 \times m^4$

....

(1)

(b) Simplify $(5np^3)^3$

....

(2)

(c) Simplify $\dfrac{32q^9 r^4}{4q^3 r}$

....

(2)

(Total for Question 6 is 5 marks)

7 Patrick has to work out the exact value of $64^{\frac{1}{4}}$

Patrick says,

"$\dfrac{1}{4}$ of 64 is 16 so $64^{\frac{1}{4}} = 16$"

Explain what is wrong with what Patrick says.

....

....

....

(Total for Question 7 is 1 mark)

8 (a) Find the value of $\sqrt[4]{81 \times 10^8}$

....

(2)

(b) Find the value of $64^{-\frac{1}{2}}$

....

(2)

(c) Write $\dfrac{3^n}{9^{n-1}}$ as a power of 3

....

(2)

(Total for Question 8 is 6 marks)

9 (a) Simplify $\left(\dfrac{1}{m^2}\right)^0$

....

(1)

(b) Simplify $\dfrac{8(x-4)}{(x-4)^2}$

....

(1)

(c) Simplify $(3n^4w^2)^3$

....

(2)

(Total for Question 9 is 4 marks)

9 (a) Simplify $\left(\dfrac{1}{m^2}\right)^0$

10 (a) Simplify $n^3 \times n^5$

....

(1)

Simplify $\dfrac{c^3 d^4}{c^2 d}$

....

(2)

Solve $\dfrac{5x}{2} > 7$

....

(2)

(Total for Question 10 is 5 marks)

11 (a) Write down the value of 7^0

....

(1)

(b) Find the value of $3 \times 3^6 \times 3^{-6}$

....

(1)

(c) Find the value of 2^{-4}

....

(1)

(d) Find the value of $27^{\frac{1}{3}}$

....

(1)

(Total for Question 11 is 4 marks)

12 $(ax^6)^{\frac{1}{n}} = 7x^3$

Work out the value of a and the value of n.

$a = $ ....

$n = $ ....

(Total for Question 12 is 2 marks)

13 Work out the value of $\dfrac{3^7 \times 3^{-2}}{3^3}$

....

(Total for Question 13 is 2 marks)

13 Work out the value of $\dfrac{3^7 \times 3^{-2}}{3^3}$

14 (a) Work out the value of $\left(\dfrac{16}{81}\right)^{\frac{3}{4}}$

....

(2)

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

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

....

(2)

(Total for Question 14 is 4 marks)

15 (a) Simplify $(p^2)^5$

....

(1)

(b) Simplify $12x^7y^3 \div 6x^3y$

....

(2)

(Total for Question 15 is 3 marks)

16 Given that $9^{-\frac{1}{2}} = 27^{\frac{1}{4}} \div 3^{x+1}$

find the exact value of x.

$x =$ ....

(Total for Question 16 is 3 marks)

16 Given that $9^{-\frac{1}{2}} = 27^{\frac{1}{4}} \div 3^{x+1}$

find the exact value of x.

17 Simplify $(2^{-5} \times 2^8)^2$

Give your answer as a power of 2

....

(Total for Question 17 is 2 marks)

17 Simplify $(2^{-5} \times 2^8)^2$

Give your answer as a power of 2

18 Work out the value of $\left(\dfrac{8}{27}\right)^{\frac{4}{3}}$

....

(Total for Question 18 is 2 marks)

18 Work out the value of $\left(\dfrac{8}{27}\right)^{\frac{4}{3}}$

19 (a) Simplify fully $(3x^5y^6)^4$

....

(2)

(b) Expand and simplify $(x + 2)(x - 3)(x + 4)$

....

(3)

(Total for Question 19 is 5 marks)

20 Work out the value of $\dfrac{\left(5\frac{4}{9}\right)^{-\frac{1}{2}} \times \left(4\frac{2}{3}\right)}{2^{-3}}$

You must show all your working.

....

(Total for Question 20 is 4 marks)

21 (a) Express $\sqrt{\dfrac{10^{360}}{10^{150} \times 10^{90}}}$ as a power of 10

....

(3)

Liam was asked to express $(12^{50})^2$ as a power of 12

Liam wrote $(12^{50})^2 = 12^{50^2} = 12^{2500}$

Liam's method is wrong.

(b) Explain why.

....

....

....

(1)

(Total for Question 21 is 4 marks)