

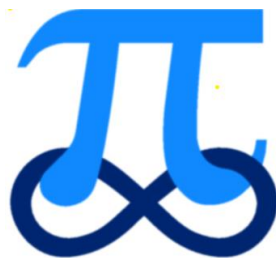
*KumarMaths*

Pearson Edexcel

GCSE Maths (9 – 1)

Past Exam Questions by  
Topics

Indices: Higher



1.. Work out the value of  $\frac{3^7 \times 3^{-2}}{3^3}$

.....  
(2 marks)

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

.....  
(2)

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

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

.....  
(2)  
(4 marks)

3. (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)

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

(4 marks)

.....  
(1)

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

.....  
(2)

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

.....  
(2)

(5 marks)

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

.....  
(1)

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

.....  
(2)

(3 marks)

5.  $p^3 \times p^x = p^9$

(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)

(4 marks)

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

.....  
(2)

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

.....  
(2)

(4 marks)

7.  $16^{\frac{1}{5}} \times 2^x = 8^{\frac{3}{4}}$

Work out the exact value of  $x$ .

.....  
(3 marks)

8.. (a) Write down the value of  $49^{\frac{1}{2}}$

.....  
(1)

(b) Write  $\sqrt{45}$  in the form  $k\sqrt{5}$ , where  $k$  is an integer.

.....  
(1)

(2 marks)

9. Find the value of  $n$  so that  $\frac{2^6 \times 2^3}{2^n} = 2^5$

(2 marks)

10. Given that  $\left(2^{\frac{1}{2}}\right)^n = \frac{2^x}{8^y}$

express  $n$  in terms of  $x$  and  $y$ .

.....

(3 marks)

11. (a) Write down the value of  $25^0$

.....

(1)

(b) Write down the value of  $49^{-\frac{1}{2}}$

.....

(1)

(c) Write as a power of 2,  $\frac{4 \times 8}{16^3}$

.....

(3)

(5 marks)

12. Write these numbers in order of size.

Start with the smallest number.

$$2^5 \qquad 64^{\frac{1}{2}} \qquad 4^3 \qquad 8^{\frac{1}{3}} \qquad 16 \qquad 64^0$$

You must show clearly how you got your answer

.....

**(3 marks)**

13. (a) Simplify  $p^5 \times p^4$

.....

**(1)**

(b) Simplify  $q^5 \div q^2$

.....

**(1)**

(c) Simplify  $12tu^6 \div 6tu^5$

.....

**(2)**

(d) Simplify  $(9w^2y^6)^{\frac{1}{2}}$

.....

**(2)**

(e) For  $x > 1$ , write the following expressions in order of size.

Start with the expression with the least value.

$$x^0 \qquad x^2 \qquad x \qquad x^{-2} \qquad x^{\frac{1}{2}}$$

**(2)**

**(8 marks)**

14. (a) Write down the value of  $9^{\frac{1}{2}}$

.....  
(1)

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

.....  
(1)

$$2^k = 16$$

(c) Write down the value of  $k$ .

.....  
(1)

(d) Solve  $8^5 = 2^{2m+3}$

.....  
(3)

**(Total 6 marks)**

15. Find the value of  $x$  when  $3^{2x} = \frac{1}{81}$

$x =$  .....

**(2 marks)**



16. (a) Simplify, leaving your answers in index form,

(i)  $7^5 \times 7^2 \times 7$

.....

(ii)  $(4^7)^2$

.....

(2)

(b)  $\frac{5^n \times 5^3}{5^6} = 5^4$

Find the value of  $n$ .

$n =$  .....

(2)

(4 marks)

17. Find the value of  $64^{\frac{2}{3}}$

.....

(2 mark)

18. Given that  $3^{-n} = 0.2$

find the value of  $(3^4)^n$

.....

(2 marks)

19. (a) Find the value of  $\sqrt[4]{27 \times 3 \times 10^8}$

.....

(2)

(b) Find the value of  $\left(\frac{216}{1000}\right)^{-\frac{2}{3}}$

.....

(2)

(Total for Question 15 is 4 marks)

20. (a) Write down the value of

(i)  $7^0$

.....

(ii)  $5^{-2}$

.....

(iii)  $16^{\frac{1}{2}}$

.....

(3)

(b) Simplify fully  $\frac{10a^7b^4}{2a^3b}$

.....

(2)

(5 marks)