

# Powers, Roots & Standard Form

## Question Paper

Course	Edexcel IGCSE Maths
Section	1. Numbers & the Number System
Topic	Powers, Roots & Standard Form
Difficulty	Medium

**Time allowed:** 70  
**Score:** /52  
**Percentage:** /100

### Question 1

One sheet of paper is  $9 \times 10^{-3}$  cm thick.

Mark wants to put 500 sheets of paper into the paper tray of his printer.  
The paper tray is 4 cm deep.

Is the paper tray deep enough for 500 sheets of paper?  
You must explain your answer.

[3 marks]

### Question 2

Write the following numbers in order of size.  
Start with the smallest number.

$0.038 \times 10^2$

$3800 \times 10^{-4}$

$380$

$0.38 \times 10^{-1}$

[2 marks]

### Question 3a

Write down the value of  $10^0$ .

[1 mark]

### Question 3b

Write down the value of  $10^{-2}$ .

[1 mark]

### Question 3c

Write these numbers in order of size.  
Start with the smallest number.

$2.73 \times 10^3$

$27.3 \times 10^{-3}$

$273 \times 10^2$

$0.00273$

[2 marks]

### Question 4a

Write down the value of  $100^{\frac{1}{2}}$ .

[1 mark]

### Question 4b

Find the value of  $125^{\frac{2}{3}}$ .

[2 marks]

### Question 5a

Write down the value of  $36^{\frac{1}{2}}$ .

[1 mark]

### Question 5b

Write down the value of  $23^0$ .

[1 mark]

**Question 5c**

Work out the value of  $27^{-\frac{2}{3}}$ .

[2 marks]

**Question 6a**

The table shows some information about eight planets.

Planet	Distance from Earth (km)	Mass (kg)
Earth	0	$5.97 \times 10^{24}$
Jupiter	$6.29 \times 10^8$	$1.898 \times 10^{27}$
Mars	$7.83 \times 10^7$	$6.42 \times 10^{23}$
Mercury	$9.17 \times 10^7$	$3.302 \times 10^{23}$
Neptune	$4.35 \times 10^9$	$1.024 \times 10^{26}$
Saturn	$1.28 \times 10^9$	$5.68 \times 10^{26}$
Uranus	$2.72 \times 10^9$	$8.683 \times 10^{25}$
Venus	$4.14 \times 10^7$	$4.869 \times 10^{24}$

Write down the name of the planet with the greatest mass.

[1 mark]

**Question 6b**

Find the difference between the mass of Venus and the mass of Mercury.

[1 mark]

**Question 6c**

Nishat says that Neptune is over a hundred times further away from Earth than Venus is.

Is Nishat right?

You must show how you get your answer.

[2 marks]

**Question 7**

Work out  $(13.8 \times 10^7) \times (5.4 \times 10^{-12})$

Give your answer as an ordinary number.

[2 marks]

**Question 8a**

Write down the value of  $10^0$ .

[1 mark]

**Question 8b**

Write  $6.7 \times 10^{-5}$  as an ordinary number.

[1 mark]

**Question 8c**

Work out the value of  $(3 \times 10^7) \times (9 \times 10^6)$ .

Give your answer in standard form.

[2 marks]

**Question 9**

Calculate  $9 \times 10^4 \times 3 \times 10^3$ .

Give your answer in standard form.

[2 marks]

**Question 10**

Work out the value of  $(9 \times 10^{-4}) \times (3 \times 10^7)$ .

Give your answer in standard form.

[2 marks]

**Question 11a**

Work out the value of  $25^{-3}$ .

[1 mark]

**Question 11b**

Work out the value of  $350^3$ .

Give your answer in standard form.

[2 marks]

**Question 12**

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

Patrick says,

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

Explain what is wrong with what Patrick says.

[1 mark]

**Question 13a**

The table shows information about the surface area of each of the world's oceans.

Ocean	Surface area in square kilometres
Pacific	$1.56 \times 10^8$
Indian	$6.86 \times 10^7$
Southern	$2.03 \times 10^7$
Arctic	$1.41 \times 10^7$
Atlantic	$1.06 \times 10^8$

Work out the difference, in square kilometres, between the surface area of the Atlantic Ocean and the surface area of the Indian Ocean.

Give your answer in standard form.

.....square kilometres

[2 marks]

**Question 13b**

The surface area of the Pacific Ocean is  $k$  times the surface area of the Arctic Ocean.

Work out the value of  $k$ .

Give your answer correct to the nearest whole number.

$k = \dots\dots\dots$

[1 mark]

### Question 14

Write  $(\sqrt[4]{8})^5$  as a power of 2.

[3 marks]

### Question 15

You are given that  $177147 = 3^{11}$

$$3^n = 177147 \times 9^5$$

Find the value of  $n$ .

[3 marks]



### Question 16a

A company makes sweets.  
The sweets are put into packets.

Here are some facts.

$$1.47 \times 10^7$$

sweets are made every day

$$3.5 \times 10^5$$

packets of sweets are  
produced every day

Calculate the mean number of sweets in one packet.

[2 marks]

### Question 16b

Sweets are made on 288 days each year.

Calculate the number of sweets made each year.  
Give your answer in standard form.

[3 marks]

**Question 16c**

The company has 152 machines making the sweets.  
Each machine operates for 15 hours each day.

i)

Calculate the number of sweets made by one machine each hour.  
Give your answer as an ordinary number correct to the nearest 10.

[3]

ii)

State one assumption you have made in part (c)(i).

[1]

**[4 marks]**