MATHEMATICS ASSESSMENT 2021 - 2022
Topic: Chapter 3 – Powers and Roots
Year: 9 C**ourse:** IGCSE
Name:_____ Date: _____
Show all working. Calculators **are allowed** in this task.

...../50

Questions

Q1.

(a) Write 0.000451 in standard form.

.....

(1)

(b) Work out $\frac{7.8 \times 10^5}{2.4 \times 10^{-4}}$

Give your answer in standard form.

.....

(2)

(Total for question = 3 marks)

Q2.

The table shows the diameters, in kilometres, of five planets.

Planet	Diameter (km)
Venus	1.2×10^4
Jupiter	1.4×10^5
Neptune	5.0×10^4
Mars	6.8×10^3
Saturn	1.2×10^5

(a) Which of these planets has the smallest diameter?

.....

(1)

(b) Calculate the difference, in kilometres, between the diameter of Saturn and the diameter of Neptune.
Give your answer in standard form.

.....km

(2)

The diameter of the Moon is 3.5×10^3 km.
The diameter of the Sun is 1.4×10^6 km.

(c) Calculate the ratio of the diameter of the Moon to the diameter of the Sun.
Give your answer in the form 1 : *n*

.....

(2)

(Total for question = 5 marks)

Q3.

(a) Write down the cube root of 64

.....

(1)

(b) Calculate the value of $2^3 \times 4^5$

.....

(2)

(c) Express 600 as a product of powers of its prime factors.
Show your working clearly.

.....

(3)

(Total for question = 6 marks)

Q4.

(a) Work out the value of $\frac{\sqrt{7.4}}{9.8 - 2.1}$
Give your answer as a decimal.
Write down all the figures on your calculator display.

.....

(2)

(b) Give your answer to part (a) correct to 2 significant figures.

.....

(1)

(Total for question = 3 marks)

Q5.

2.2×10^7 passengers passed through Beijing Capital International Airport in 2014.

(a) Write 2.2×10^7 as an ordinary number.

.....

(1)

950 000 tonnes of cargo traffic passed through Tokyo International Airport in 2014.

(b) Write 950 000 as a number in standard form.

.....

(1)

(Total for question = 2 marks)

Q6.

(a) $A = 2^2 \times 3 \times 5^2$

$B = 2^3 \times 5$

(i) Find the Highest Common Factor (HCF) of A and B.

.....

(ii) Find the Lowest Common Multiple (LCM) of A and B.

.....

(3)

(b) $\frac{8^2 \times 8^3}{8^4} = 2^n$

Find the value of n.

n = ...

(2)

(Total for question = 5 marks)

Q7.

(a) Find the value of the cube of 4

.....

(1)

(b) Write $3 \times 3 \times 3 \times 3 \times 3$ as a single power of 3

.....

(1)

(c) Write $\frac{7^5 \times 7^9}{7^6}$ as a single power of 7

.....

(2)

(Total for Question is 4 marks)

Q8.

$3780 = 2^2 \times 3^3 \times 5 \times 7$	$3240 = 2^3 \times 3^4 \times 5$

(a) Find the highest common factor (HCF) of 3780 and 3240
Give your answer as a product of prime factors.

.....

(2)

(b) Find the lowest common multiple (LCM) of 3780 and 3240
Give your answer as a product of prime factors.

.....

(2)

(Total for question = 4 marks)

Q9.

(a) Find the Highest Common factor (HCF) of 75 and 90

.....

(2)

(b) Find the Lowest Common Multiple (LCM) of 75 and 90

.....

(2)

(Total for question is 4 marks)

Q10.

(a) Express 600 as a product of powers of its prime factors.
Show your working clearly.

.....

(3)

(b) Simplify $\dfrac{5^{12}}{5^2 \times 5}$
Give your answer as a power of 5

.....

(2)

(Total for question = 5 marks)

Q11.

(a) Simplify $\frac{x^9}{x^2}$

.....

(1)

(b) Write $\frac{7^8 \times 7^4}{7^3}$ as a single power of 7

.....

(2)

(Total for question = 3 marks)

Q12.

(a) Simplify $(16y^8)^{\frac{3}{4}}$

.....

(2)

(b) Given that $2^p \times 8^q = 2^n$
express n in terms of p and q.

n = ...

(2)

(Total for question is 4 marks)

Q13.

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

(i) $6^5 \times 6^2 \times 6$

.....

(ii) $(9^7)^2$

.....

(2)

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

Find the value of n.

n = ...

(2)

(Total for question = 4 marks)

Q14.

(a) Write $3 \times 3 \times 3 \times 3 \times 3$ as a single power of 3

.....

(1)

(b) Write $\dfrac{7^5 \times 7^9}{7^6}$ as a single power of 7

.....

(2)

(Total for Question is 3 marks)