Name: _____

IGCSE (9-1) Maths
topics new to Foundation tier:
Standard form

Date:

Time: 60 minutes

Total marks available: 50

Total marks achieved: _____

Q1.

(*a*) Write as an ordinary number

(i) 4.2×10^6

(ii) 3.82×10^{-4}

(2)

(*b*) Here are three numbers written in standard form.
Arrange these numbers in order of size.
Start with the smallest number.

5.6×10^{-7} 8.6×10^{-9} 5.64×10^{-8}

(2)

(Total 4 marks)

Q2.

(*a*) Write 7.9×10^{-4} as an ordinary number.

(1)

(*b*) Work out $(6.5 \times 10^5) \times (3.1 \times 10^4)$
Give your answer in standard form.

(2)

(Total 3 marks)

Q3.

(*a*) Write 1.2×10^{-5} as an ordinary number.

(1)

(*b*) Work out $7.9 \times 10^5 + 6 \times 10^4$
Give your answer in standard form.

(2)

(Total 3 marks)

Q4.

(*a*) Write 0.000076 in standard form.

(1)

The area covered by the Pacific Ocean is 1.6×10^8 km^2
The area covered by the Arctic Ocean is 1.4×10^7 km^2

(*b*) Write 1.6×10^8 as an ordinary number.

(1)

The area covered by the Pacific Ocean is *k* times the area covered by the Arctic Ocean.

(*c*) Find, correct to the nearest integer, the value of *k*.

k = ...

(2)

(Total 4 marks)

Q5. The table gives the diameters, in metres, of four planets.

Planet	Diameter (metres)
Mercury	4.88×10^6
Venus	1.21×10^7
Earth	1.28×10^7
Mars	6.79×10^6

(*a*) Which planet has the largest diameter?

(1)

(*b*) Write 6.79×10^6 as an ordinary number.

(1)

(*c*) Calculate the difference, in metres, between the diameter of Venus and the diameter of Mercury.
Give your answer in standard form.

..... metres

(2)

(Total 4 marks)

Q6. The table gives the surface areas, in square kilometres, of five seas.

Sea	Surface area in square kilometres
Mediterranean Sea	2.97×10^6
East China Sea	1.25×10^6
Baltic Sea	4.22×10^5
Red Sea	4.38×10^5
Okhotsk Sea	1.59×10^6

(*a*) Write 1.59×10^6 as an ordinary number.

(1)

(*b*) Work out the difference, in square kilometres, between the largest surface area and the smallest surface area for these five seas.
Give your answer in standard form.

..... km^2

(2)

The surface area of the East China Sea is *k* times the surface area of the Baltic Sea.

(*c*) Work out the value of *k*.
Give your answer to the nearest whole number.

k = ...

(2)

(Total for question = 5 marks)

Q7. The table gives the populations of each of five countries in 2014

Country	Population
China	1.4×10^9
India	1.3×10^9
USA	3.2×10^8
Ethiopia	9.7×10^7
Mexico	1.2×10^8

(*a*) Write 9.7×10^7 as an ordinary number.

(1)

The population of Russia in 2014 was 140000000

(*b*) Write 140000000 in standard form.

(1)

In 2014, there were more people living in China than were living in the USA.

(*c*) How many more?
Give your answer in standard form.

(2)

In 2014, the population of India was *k* times the population of Mexico.

(*d*) Work out the value of *k*.
Give your answer to the nearest whole number.

k = ...

(2)

(Total 6 marks)

Q8. The table shows some information about the five Great Lakes in North America.

Name	Surface area (m^2)	Volume of water (m^3)
Lake Erie	2.57×10^{10}	4.80×10^{11}
Lake Huron	6.01×10^{10}	3.52×10^{12}
Lake Michigan	5.80×10^{10}	4.87×10^{12}
Lake Ontario	1.91×10^{10}	1.64×10^{12}
Lake Superior	8.21×10^{10}	1.22×10^{13}

(*a*) Work out the total surface area of the five Great Lakes.
Give your answer in standard form.

..... m^2
(2)

Loch Ness is the largest lake in Scotland.
The lake has a volume of water of 7.45×10^9 m^3
The volume of water in Lake Superior is k times the volume of water in Loch Ness.

(*b*) Work out the value of k.
Give your answer correct to 3 significant figures.

k = ...
(2)

(Total 4 marks)

Q9. The table shows the land areas, in km^2, of four countries.

Country	Land area (km^2)
Ethiopia	1.13×10^6
Algeria	2.38×10^6
Nigeria	9.24×10^5
Kenya	5.83×10^5

(*a*) Which country has the largest land area?

(1)

(*b*) Calculate the total land area, in km^2, of all four countries.
Give your answer in standard form.

..... km^2
(2)

Population density is calculated by the formula

Population density = Population ÷ Land area

(*c*) In one year, the population of Ethiopia was 7.91×10^7
Calculate the population density of Ethiopia for that year.

..... people / km^2
(2)

(Total 5 marks)

Q10. The table shows the population of each of three countries in 2012.

Country	Population
India	1.21×10^9
Turkey	7.48×10^7
Singapore	5.2×10^6

(*a*) Find the total population of India, Turkey and Singapore in 2012.
Give your answer in standard form.

(2)

Population density is calculated by the formula

Population density = Population ÷ Land area

The land area of India is 3.29×10^6 km^2

(*b*) Calculate the population density of India in 2012.
Give your answer correct to 3 significant figures.

..... people/km^2
(2)

(Total 4 marks)

Q11. The table shows information about the oil production, in barrels per day, of five countries during one year.

Country	Oil production (barrels per day)
India	8.97×10^5
Brazil	2.63×10^6
United States	8.4×10^6
Russia	1.09×10^7
Saudi Arabia	9.9×10^6

(*a*) Which country had the highest oil production?

(1)

(*b*) Calculate the difference between the oil production of Brazil and the oil production of India.
Give your answer in standard form.

..... barrels per day

(2)

(Total 3 marks)

Q12. 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 5 marks)

Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
(a) (i)		4200000	1	B1
(a) (ii)		(0).000382	1	B1
(b)	8.6×10^{-9} 5.64×10^{-8} 5.6×10^{-7}		2	B2 B1 for smallest or largest in correct position
				Total 4 marks

Q2.

Question	Working	Answer	Mark	Notes
a		0.00079	1	B1 cao
b		2.015×10^{10}	2	M1 for 20.15×10^9 **or** 20 150 000 000 or 2.015×10^n where $n \neq 10$ A1 For 2×10^{10} or better
				Total 3 marks

Q3.

Question	Working	Answer	Mark	Notes
(a)		0.000012	1	B1
(b)	$790000 + 60000$ **or** $79 \times 10^4 + 6 \times 10^4$ **or** $7.9 \times 10^5 + 0.6 \times 10^5$			M1 or sight of digits 85
		8.5×10^5	2	A1
				Total 3 marks

Q4.

Q	Working	Answer	Mark	Notes
(a)		7.6×10^{-5}	1	B1
(b)		160 000 000	1	B1
(c)	$\frac{1.6 \times 10^8}{1.4 \times 10^7}$ or $\frac{16}{1.4}$ or $\frac{80}{7}$ or $\frac{160000000}{14000000}$ or 11.428...		2	M1
		11		A1 cao
				Total 4 marks

Q5.

Q	Working	Answer	Mark	Notes
(i)	$2x \geq 6 - 13$ oe	$x \geq -3.5$ oe	2	M1 Condone $2x > 6 - 13$ oe A1 mark response on answer line (do not isw) correct answer with no working = M1A1
(ii)		$-3, -2, -1$	2	B2 any order B1 for $-3, -2, -1,$ 0
				Total 4 marks

Q6.

Question	Working	Answer	Mark	Notes
(a)		1 590 000	1	B1 cao
(b)	$2.97 \times 10^6 - 4.22 \times 10^5$ oe **or** $4.22 \times 10^5 - 2.97 \times 10^6$ oe **or** $\pm$ 2548000			M1
		$\pm 2.548 \times 10^6$	2	A1 allow $\pm 2.5 \times 10^6$ or $\pm 2.55 \times 10^6$ if working shown.
(c)	$1.25 \times 10^6 \div 4.22 \times 10^5$ oe **or** 2.96… **or** $\frac{625}{211}$			M1
		3	2	A1 cao
				Total 5 marks

Q7.

Q	Working	Answer	Mark	Notes
(a)		97 000 000	1	B1
(b)		1.4×10^8	1	B1 Accept, for example, 1.40×10^8
(c)	$1.4 \times 10^9 - 3.2 \times 10^8$ or 1 400 000 000 – 320 000 000 or 1 080 000 000	1.08×10^9	2	M1 For $1.4 \times 10^9 - 3.2 \times 10^8$ or A1 digits 108 Accept 1.1×10^9
(d)	$(1.3 \times 10^9) \div (1.2 \times 10^8)$ or 1 300 000 000 ÷ 120 000 000 or 10.8(333…)	11	2	M1 Condone missing brackets A1 Accept $1.1 \times 10^{\mathbf{1}}$
				Total 6 marks

Q8.

Question	Working	Answer	Mark	Notes
(a)	$2.57 \times 10^{10} + 6.01 \times 10^{10} + 5.80 \times 10^{10} + 1.91 \times 10^{10} + 8.21 \times 10^{10}$ **or** 2.57 + 6.01 + 5.8 + 1.91 + 8.21 **or** 245 000 000 000 oe **or** digits 245		2	M1 for clear intention to add all surface areas
		2.45×10^{11}		A1 cao
(b)	$(1.22 \times 10^{13}) \div (7.45 \times 10^{9})$ **or** 1637(.58…) **or** digits 1637(58…)		2	M1 condone missing brackets
		1640		A1 accept 1637 – 1640 (may be in standard form)
				Total 4 marks

Q9.

Question	Working	Answer	Mark	Notes
(a)		Algeria	1	B1 Accept 2.38×10^6
(b)	$1.13 \times 10^6 + 2.38 \times 10^6 + 9.24 \times 10^5 + 5.83 \times 10^5$ or digits 5017	5.017×10^6	2	M1 Intention to add 4 correct values. A1 accept 5×10^6 or better
(c)	$7.91 \times 10^7 \div 1.13 \times 10^6$	70 oe	2	M1 A1
				Total 5 marks

Q10.

Question	Working	Answer	Mark	Notes
(a)	1.21 x 109 + 7.48 x 107 + 5.2 x 106	1.29 x 109	2	M1 Intention to add 3 correct numbers or digits 1 290 … A1 cao Must be in standard form.
(b)	(1.21 x 109) ÷ (3.29 x 106)	368	2	M1 A1 awrt 368 (367.781153..)
				Total 4 marks

Q11.

The correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question	Working	Answer	Mark	Notes
(a)		Russia	1	B1
(b)	$(2.63 \times 10^6) - (8.97 \times 10^5)$ **or** 1733(000) oe		2	M1 condone missing brackets
		1.733×10^6		A1 Accept 1.73×10^6
(c)	$(6.3 \times 10^5) \div (8.4 \times 10^6)$			M1
		7.5% oe	2	A1accept percentage, fraction, decimal or ratio eg. $\frac{3}{40}$ **or** 0.075 **or** 3 : 37 SC: B1 for a ratio of 3 : 40 oe
				Total 5 marks

Q12.

Q	Working	Answer	Mark	Notes
(a)		Mars	1	B1
(b)	$1.2 \times 10^5 - 5.0 \times 10^4$ or 70000	7×10^4	2	M1 Correct values with intention to subtract A1 M1 A0 for 70000 with no working
(c)	$(1.4 \times 10^6) \div (3.5 \times 10^3)$	1:400 oe	2	M1 Correct values with intention to divide A1 M1 A0 for 400 or 400:1 with no working
				Total 5 marks