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12. 1 astronomical unit = 150 million kilometres.

(a) Write the number 150 million in standard form.

..... (2)

The distance from Venus to the Sun is 108 million kilometres.

(b) Express 108 million kilometres in astronomical units. Give your answer in standard form.

..... astronomical units (2)

(Total 4 marks)

Q12

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20. (a) Evaluate $5 \times 10^{12} + 9 \times 10^{12}$. Give your answer in standard form.

..... (2)

(b) Each of the numbers p , q and r is greater than 1 and less than 10

$p \times 10^{15} + q \times 10^{15} = r \times 10^n$
 $p + q > 10$

(i) Find the value of n .

$n =$

(ii) Find an expression for r in terms of p and q .

$r =$ (3)

(Total 5 marks)

Q20

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13. (a) Write the number 78 000 000 in standard form.

..... (1)

(b) Write 4×10^{-3} as an ordinary number.

..... (1)

(c) Work out the value of $\frac{3 \times 10^{-2}}{8 \times 10^9}$

Give your answer in standard form.

..... (1)

(Total 3 marks)

Q13

11. The distance between the Earth and the Sun is 150 000 000 km.

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(a) Write the number 150 000 000 in standard form.

.....
(1)

The distance between Neptune and the Sun is 30 times greater than the distance between the Earth and the Sun.

(b) Calculate the distance between Neptune and the Sun.
Give your answer in standard form.

..... km
(2)

Q11

(Total 3 marks)

22. (a) Each of the numbers x , y and z is greater than 1 and less than 10

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$$x \times 10^5 + y \times 10^4 = z \times 10^5$$

Find an expression for z in terms of x and y .
Give your answer as simply as possible.

$z =$
(2)

(b) Each of the numbers 3×10^n , 4×10^m and $a \times 10^p$ is in standard form.

$$\frac{3 \times 10^n}{4 \times 10^m} = a \times 10^p$$

(i) Find the value of a .

$a =$

(ii) Find an expression for p in terms of n and m .

$p =$
(3)

(Total 5 marks)

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Q22