



# EXAM PAPERS PRACTICE

GCSE OCR Math J560

Standard form

Answers

*"We will help you to  
achieve A Star "*



**Answer 1**

Work out the value of  $(7.5 \times 10^4) \times (2.5 \times 10^3)$   
Give your answer in standard form.

$$(7.5 \times 10^4) \times (2.5 \times 10^3)$$

$$= 1.87500000.$$

$$= \underline{1.875 \times 10^8}$$

STANDARD FORM  
ONE NON ZERO DIGIT  
BEFORE DECIMAL POINT



**Answer 2**

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	$4.14 \times 10^7$	$4.869 \times 10^{24}$

(a) Write down the name of the planet with the greatest mass.

JUPITER



**Answer 3**

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

(c) Is Nishat right?

You must show how you get your answer.

$$\frac{\text{NEPTUNE}}{\text{VENUS}} = \frac{4.35 \times 10^9}{4.14 \times 10^7}$$

$$= 105.07...$$

YES, AS  $105 > 100$



**Answer 4**

(b) Find the difference between the mass of Venus and the mass of Mercury.

$$\begin{aligned} & \text{VENUS} - \text{MERCURY} \\ &= 4.869 \times 10^{24} - 3.302 \times 10^{23} \\ &= 4.5388 \times 10^{24} \end{aligned}$$



**Answer 5**

Work out the value of  $(3 \times 10^7) \times (9 \times 10^6)$   
Give your answer in standard form.

$$\begin{aligned} & (3 \times 10^7) \times (9 \times 10^6) \\ &= 3 \times 9 \times 10^7 \times 10^6 \\ &= 27 \times 10^{13} \\ &= 2.7 \times 10^1 \times 10^{13} \\ &= \underline{\underline{2.7 \times 10^{14}}} \end{aligned}$$

INDICES!

$$\underline{a^p \times a^q = a^{p+q}} \quad (2)$$

S.F. ONE NON ZERO  
NUMBER BEFORE  
DECIMAL POINT



**Answer 6**

Work out  $(13.8 \times 10^7) \times (5.4 \times 10^{-12})$   
Give your answer as an ordinary number.

$$(13.8 \times 10^7) \times (5.4 \times 10^{-12})$$
$$= 7.452 \times 10^{-4}$$

$$0.0007452$$

$$= \underline{\underline{0.0007452}}$$

STANDARD FORM

- ONE NON-ZERO NUMBER BEFORE THE DECIMAL POINT
- $\times 10^?$ 
  - ? IS POSITIVE FOR NUMBERS  $> 1$
  - ? IS NEGATIVE FOR NUMBERS  $< 1$
  - ? IS THE NUMBER OF TIMES YOU HAVE TO "MOVE" THE DECIMAL POINT



**Answer 7**

Write 0.000068 in standard form.

$$0.000068$$
$$= \underline{\underline{6.8 \times 10^{-5}}}$$

STANDARD FORM

- ONE NON-ZERO NUMBER BEFORE THE DECIMAL POINT
- $\times 10^?$ 
  - ? IS POSITIVE FOR NUMBERS  $> 1$
  - ? IS NEGATIVE FOR NUMBERS  $< 1$
  - ? IS THE NUMBER OF TIMES YOU HAVE TO "MOVE" THE DECIMAL POINT





**Answer 8**

Calculate  $9 \times 10^4 \times 3 \times 10^3$   
Give your answer in standard form.

$$\begin{aligned} & 9 \times 10^4 \times 3 \times 10^3 \\ &= 9 \times 3 \times 10^4 \times 10^3 \\ &= 27 \times 10^7 \\ &= 2.7 \times 10^1 \times 10^7 \\ &= \underline{\underline{2.7 \times 10^8}} \end{aligned}$$

$$\begin{aligned} \text{RECIPROCAL OF } a & \text{ IS } \frac{1}{a} \\ \text{RECIPROCAL OF } \frac{a}{b} & \text{ IS } \frac{b}{a} \end{aligned}$$

$$\begin{aligned} & \text{INDICES} \\ & \frac{a^{-p}}{a^p} = \frac{1}{a^p} \\ & a^p \times a^q = a^{p+q} \end{aligned}$$



**Answer 9**

- (b) Work out the value of  $(2.52 \times 10^5) \div (4 \times 10^{-3})$   
Give your answer in standard form.

$$\frac{2.52 \times 10^5}{4 \times 10^{-3}}$$

$$= 0.63 \times 10^{5 - (-3)}$$

$$= 0.63 \times 10^8$$

$$= 0.63 \times 10 \times 10^7$$

$$= \underline{6.3 \times 10^7}$$

$$4 \overline{) 2.52} \quad \begin{array}{r} 0.63 \\ \hline \end{array}$$

INDICES / POWERS

$$\boxed{\frac{a^p}{a^q} = a^{p-q}}$$



**Answer 10**

(a) Write  $7.97 \times 10^{-6}$  as an ordinary number.

$$7.97 \times 10^{-6}$$

0.00000797

STANDARD FORM

- ONE NON-ZERO NUMBER BEFORE THE DECIMAL POINT
- $\times 10^?$ 
  - ? IS POSITIVE FOR NUMBERS  $> 1$
  - ? IS NEGATIVE FOR NUMBERS  $< 1$
  - ? IS THE NUMBER OF TIMES YOU HAVE TO "MOVE" THE DECIMAL POINT

**Answer 11**

(b) Write  $4.5 \times 10^4$  as an ordinary number.

$$4.5 \times 10^4$$
$$= 45000$$



**Answer 12**

(a) Write 0.000423 in standard form.

$$\begin{aligned} & 0.000423 \\ & \quad \times \quad \times \\ & = \underline{\underline{4.23 \times 10^{-4}}} \end{aligned}$$

STANDARD FORM

- ONE NON-ZERO NUMBER BEFORE THE DECIMAL POINT
- $\times 10^?$ 
  - ? IS POSITIVE FOR NUMBERS  $> 1$
  - ? IS NEGATIVE FOR NUMBERS  $< 1$
  - ? IS THE NUMBER OF TIMES YOU HAVE TO "MOVE" THE DECIMAL POINT

**Answer 13**

(a) Write  $7.8 \times 10^{-4}$  as an ordinary number.

$$0.\underline{\underline{00078}} = \underline{\underline{0.00078}}$$

STANDARD FORM



### Answer 14

The mass of the Sun is  $2 \times 10^{30}$  kg.

The mass of the largest known star is 315 times the mass of the Sun.

(c) Work out the mass of this star.

Give your answer in kg in standard form.

$$\begin{aligned} \text{MASS} &= 315 \times 2 \times 10^{30} \\ &= 630 \times 10^{30} \text{ kg} \\ &= 6.3 \times 10^2 \times 10^{30} \\ &= 6.3 \times 10^{2+30} \\ &= \underline{6.3 \times 10^{32} \text{ kg}} \end{aligned}$$

Powers/INDICES

$$a^p \times a^q = a^{p+q}$$

### Answer 15

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

$$0.\underbrace{0000}_{5 \text{ places}}6.7$$

$$\underline{0.000067}$$