Paper Reference(s) 1AS0/01
Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Astronomy

PAPER 1: Naked-eye Astronomy

Formulae and Data Sheet

DO NOT RETURN THIS FORMULAE AND DATA BOOKLET WITH THE QUESTION PAPER.

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Formulae

Equation of Time = Apparent Solar Time (AST) – Mean Solar Time (MST)	
Kepler's 3rd law:	$\frac{T^2}{r^3}$ = a constant
Magnification of telescope:	magnification = $\frac{f_o}{f_e}$
Distance modulus formula:	$M = m + 5 - 5 \log d$
Redshift formula:	$\frac{\lambda - \lambda_0}{\lambda_0} = \frac{v}{c}$
Hubble's law:	$v = H_0 d$

Data

Mass of Earth	$6{\cdot}0 \times 10^{24}$ kg
Mean diameter of Earth	13 000 km
Mean diameter of Moon	3500 km
Mean diameter of Sun	$1{\cdot}4 \times 10^{6}$ km
One Astronomical Unit (AU)	$1{\cdot}5 \times 10^{8}$ km
Mean Earth to Moon distance	380 000 km
One light year (l.y.)	$9{\cdot}5 \times 10^{12}$ km
One parsec (pc)	$3{\cdot}1 \times 10^{13}$ km = 3·26 l.y.
Sidereal day of Earth	23 h 56 min
Synodic day of Earth	24 h 00 min
Temperature of solar photosphere	5800 K
Hubble Constant	68 km/s/Mpc
Speed of light in vacuum	$3{\cdot}0 \times 10^{8}$ m/s

Name	Type of body	Mean distance from Sun/AU	Sidereal period/ Earth year	Mean temperature /°C	Diameter /1000 km	Mass/ Earth mass	Ring system	Moons
Mercury	planet	0·38	0·24	170	4·9	0·055	no	none
Venus	planet	0·72	0·62	470	12·1	0·82	no	none
Earth	planet	1·0	1·0	15	12·8	1·00	no	1: the Moon
Mars	planet	1·5	1·9	–50	6·9	0·11	no	2 small moons: Deimos and Phobos
Ceres	dwarf planet	2·8	4·6	–105	0·95	$1{\cdot}5\times10^{-4}$	no	none
Jupiter	planet	5·2	11·9	–150	143	318	yes	4 major moons: Ganymede, Callisto, Europa, Io >60 others
Saturn	planet	9·5	29·5	–180	121	95	yes	5 major moons: including Titan, Iapetus >55 others
Uranus	planet	19·1	84·0	–210	51	15	yes	5 major moons: including Titania, Oberon >20 others
Neptune	planet	30·0	165	–220	50	17	yes	1 major moon: Triton >12 others
Pluto	dwarf planet	39·5	248	–230	2·4	$2{\cdot}2\times10^{-3}$	no	1 major moon: Charon >4 other moons
Haumea	dwarf planet	43·1	283	–241	1·4	$6{\cdot}7\times10^{-4}$	no	2
Eris	dwarf planet	67·8	557	–230	2·3	$2{\cdot}8\times10^{-3}$	no	at least 1