

Name:

Date:

P8 - Test 1
SPACE PHYSICS
Beginner

GCSE

PHYSICS

AQA - Triple Science

Mark

Grade

Materials

For this paper you must have:

- Ruler
- Pencil and Rubber
- Scientific calculator, which you are expected to use when appropriate

Instructions

- Answer all questions
- Answer questions in the space provided
- All working must be shown

Information

- The marks for the questions are shown in brackets

1.

(a) The Sun is a star.

Which galaxy is the Sun in?

Tick **one** box.

Cartwheel

Milky Way

Starburst

Tadpole

(1)

(b) Light takes 500 seconds to travel from the Sun to the Earth.

Light travels at 300 000 kilometres per second.

Calculate the distance between the Sun and the Earth.

Use the equation:

$$\text{distance} = \text{speed} \times \text{time}$$

Distance = _____ kilometres

(2)

The table below gives information about some of the planets in our solar system.

The planets are in order of increasing distance from the Sun.

Planet	Time to orbit the Sun in years
Mercury	0.2
Venus	0.6
Earth	1.0
Mars	
Jupiter	12.0

(c) There are some planets in our solar system missing from the table above.

How many planets are missing?

(1)

(d) Estimate how many years it takes Mars to orbit the Sun.

_____ years

(1)

(e) Calculate how many times Venus will orbit the Sun in 9 years.

In 9 years, Venus will orbit the Sun _____ times.

(2)

(Total 7 marks)

2.

(a) There are eight planets in orbit around the Sun.

Which other type of object orbits the Sun?

Tick **one** box.

Dwarf planet

Galaxy

Moon

Star

(1)

(b) Complete the sentences.

Choose the answers from the box.

black hole	gravity	friction
nebula	protostar	upthrust

The Sun was formed when a _____ in space was pulled together by _____ .

(2)

(c) The Sun has reached the Main Sequence stage in its lifecycle.

What stage in the lifecycle of the Sun will follow the Main Sequence stage?

(1)

The table shows some data about the eight planets that orbit the Sun.

Planet	Distance from the Sun compared to the Earth	Time to orbit the Sun in years	Mean surface temperature in °C
Mercury	0.4	0.2	+125
Venus	0.7	0.6	+465
Earth	1.0	1.0	+22
Mars	1.5	1.9	-48
Jupiter	X	12	-108
Saturn	9.6	30	-180
Uranus	19.3	84	-216
Neptune	30.0	165	-201

(d) What pattern links the distance a planet is from the Sun and the time taken by the planet to orbit the Sun?

(1)

(e) Estimate the value of **X** in the table.

Distance = _____

(1)

(f) A student looked at the data in the table and wrote the following conclusion:

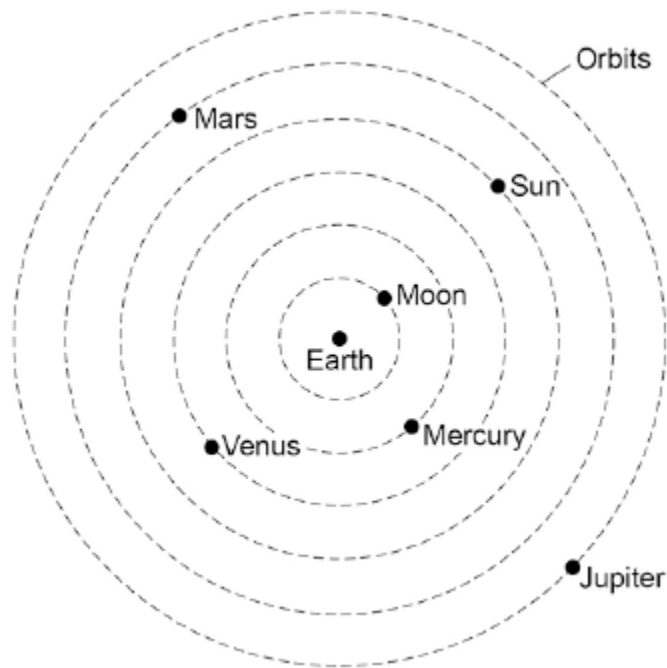
'The mean surface temperature of a planet decreases the
further the planet is from the Sun.'

Explain why this conclusion is **not** totally correct.

(3)
(Total 9 marks)

3.

The figure below shows what scientists over 1000 years ago thought the solar system was like.



(a) Give **one** way that the historical model of the solar system shown in the figure above is different from what we now know about the solar system.

(1)

(b) Give **one** way that the solar system shown in the figure above is the same as what we now know about the solar system.

(1)

(c) The first artificial satellite to orbit the Earth was launched into space in 1957.

Describe the orbit of an artificial satellite.

(1)

(d) What provides the force needed to keep a satellite in its orbit?

Tick **one** box.

friction

gravity

tension

(1)

(e) All stars go through a lifecycle.

The star Mira will go through a supernova stage in its lifecycle but the Sun will not.

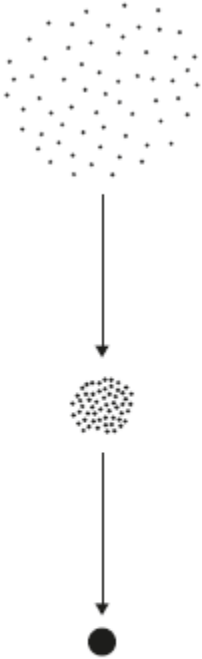
How is the star Mira different to the Sun?

(1)

(Total 5 marks)

4.

(a) The figure below shows how a star is formed.
Use **one** answer from each box to complete the sentences.



gas rock water

A star starts as a huge cloud of dust and _____ particles in space.

friction fusion gravity

The force of _____ pulls the particles in the cloud closer together.

protostar red giant white dwarf

The compressed mass of particles forms a _____.

(3)

(b) Elements heavier than iron are formed in a supernova.
What is a supernova?

Tick (✓) **one** box.

- the explosion of a massive star
- a very bright, hot young star
- a very cool super giant star

(1)

- (c) Brown dwarf stars are small stars too cool to give out visible light. They were first discovered in 1995. Scientists think that there are millions of these stars spread throughout the Universe.

Which **one** of the following is the most likely reason why brown dwarf stars were not discovered before 1995?

Tick (✓) **one** box.

Brown dwarf stars did not exist before 1995.

Scientists were looking in the wrong part of the Universe.

The telescopes and measuring instruments were not sensitive enough.

(1)

(Total 5 marks)

5.

Astronomers claim that there are about 300 billion stars in the Milky Way.

- (a) Describe how stars are formed.

(3)

- (b) Use the correct answer from the box to complete the sentence.

decay	fission	fusion
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Energy is released in stars by the process of nuclear _____ .

(1)

- (c) State why a star is stable during the 'main sequence' period of its life cycle.

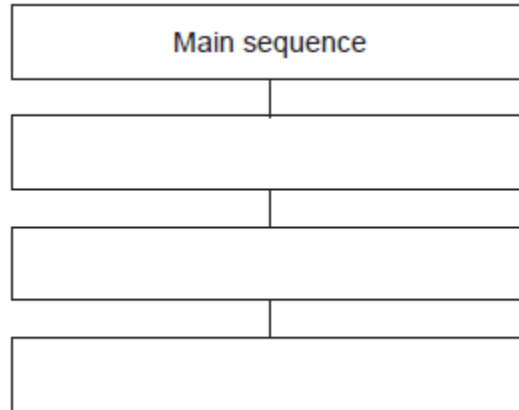
(1)

(d) The life cycle of a star after the 'main sequence' period depends on the size of the star.

A particular star is the same size as the Sun.

What are the stages, after the main sequence, in the life cycle of this star?

State them in order by writing in the boxes.



(3)

(Total 8 marks)

6.

(a) Complete the **two** spaces in the sentence.

Stars form when enough _____ and gas from _____ are pulled together by gravitational attraction.

(2)

(b) How are stars able to give out energy for millions of years?

Put a tick (✓) next to the answer.

By atoms joining together

By atoms splitting apart

By burning gases

(1)

(c) There are many billions of stars in our galaxy. Our Sun is one of these stars. What is the name of our galaxy?

(1)

(d)

Why was the Universe created?

We cannot expect scientists to answer this question. What is the reason for this?

Put a tick (✓) next to the reason.

It will take too long to collect the scientific evidence.

The answer depends on beliefs and opinions, not scientific evidence.

There is not enough scientific evidence.

(1)
(Total 5 marks)

7.

Light is given out by the Sun and a distant galaxy.

(a) Compared to the light from the Sun, the light from the distant galaxy has moved towards the red end of the spectrum.

(i) What name is given to this effect?

(1)

(ii) Complete the following sentence by drawing a ring around the line in the box that is correct.

The fact that light from a distant galaxy seems to move towards the red end of

the spectrum gives scientists evidence that

galaxies are shrinking
galaxies are changing colour
the universe is expanding

(1)

(b) Scientists have a theory that the universe began from a very small point and then exploded outwards.

(i) What name is given to this theory?

(1)

- (ii) Which statement gives a reason why scientists think that the universe began with an explosion?

Put a tick (✓) in the box next to your choice.

At the moment it is the best way of explaining our scientific knowledge.

It can be proved using equations.

People felt the explosion.

(1)
(Total 4 marks)

8.

Complete the following sentences by choosing the correct words from the box. Each word may be used once or not at all.

dwarf

giant

neutron

proton

supernova

If a red _____ star is large enough, it may eventually blow up in an explosion called a _____, leaving behind a very dense _____ star.

(Total 3 marks)