Worksheet: Light-Years

Q1: The speed of light is approximately 3×10^{8} m/s. There are approximately 3.16×10^{7} seconds in 1 year. Use these values to work out how far a beam of light will travel in 1 year. Give your answer to 2 significant figures.

Question Video

A 3.2×10^{7} m

B 6.2×10^{15} m

C 95×10^{15} m

D 9.5×10^{15} m

E 9.5×10^{14} m

Q2: There are 9.46×10^{15} meters in 1 light year. What is 1.14×10^{17} m in light-years? Give your answer to the nearest light-year.

Question Video

A 96×10^{13} light years

B 1.2×10^{33} light years

C 1.2×10^{3} light years

D 50 light years

E 12 light years

Q3: There are 9.46×10^{15} meters in 1 light year. How many meters are there in 4 light years? Give your answer to 2 significant figures.

Question Video

A 2.4×10^{15} m

B 3.8×10^{16} m

C 15×10^{16} m

D 7.6×10^{16} m

E 73×10^{16} m

Q4: The Milky Way is about 100 000 light-years in diameter. 1 light-year is equal to 9.46×10^{15} m. What is the diameter of the Milky Way in meters?

A 1.06×10^{19} m

B 9.46×10^{20} m

C 50.1×10^{20} m

D 6.45×10^{20} m

E 33.1×10^{20} m

Q5: A laser beam was fired off into space from an observatory on Earth's surface. The beam was fired into an empty region of space, so it would not interact with anything. How far, in light-years, has the beam traveled 3 years later?

A 3 light years

B 6 light years

C 1 light year

Q6: The speed of light is approximately 3×10^8 m/s. How far does a beam of light travel in 1 day? Give your answer to 2 significant figures.

A 3.2×10^{11} m

B 6.6×10^{15} m

C 2.6×10^{13} m

D 1.2×10^{12} m

E 7.2×10^{9} m

Q7: Which of the following is the correct definition of a light-year?

A. A light-year is how long it takes a beam of light to travel the distance from Earth to the Sun.

B. A light-year is how far light travels in half a year.

C. A light-year is the distance traveled by a beam of light in 1 year.

D. A light-year is how long it takes a beam of light to travel the same distance that Earth travels in 1 year.

E. A light-year is the distance traveled by a beam of light in 1 second.

Q8: List these objects in order of **decreasing** size:

- Saturn
- Pluto
- A weather satellite
- The Milky Way
- The universe

A. A weather satellite, Pluto, Saturn, the Milky Way, the universe

B. The universe, the Milky Way, Pluto, Saturn, a weather satellite

C. The universe, the Milky Way, Saturn, Pluto, a weather satellite

D. A weather satellite, Saturn, Pluto, the Milky Way, the universe

Q9: What is the name of the galaxy that the Earth is a part of?

A The Small Magellanic Cloud

B The Large Magellanic Cloud

C Andromeda

D Triangulum

E The Milky Way

Q10: List these objects in order of **increasing** size:

- The Moon
- The Sun
- The Andromeda Galaxy
- The International Space Station
- Earth

A The International Space Station, the Moon, Earth, the Sun, the Andromeda Galaxy

B The Andromeda Galaxy, the International Space Station, Earth, the Moon, the Sun

C The Moon, the International Space Station, Earth, the Sun, the Andromeda Galaxy

D The International Space Station, Earth, the Moon, the Sun, the Andromeda Galaxy

Q11: Which of the following correctly describes a galaxy?

A A galaxy is a cluster of a few hundred stars.

B A galaxy is the remnant of a supernova.

C A galaxy is a cloud of gas and dust that condenses to form a protostar.

D A galaxy is a system of planets orbiting a star.

E A galaxy is a collection of billions of stars.

Q12: How many light-years are in 3.2 Mly?

A 320 ly

B 0.0032 ly

C $32,000$ ly

D $3,200,000$ ly

E $32,000,000$ ly