

Standard form and compound measures

ANSWERS

1

Light travels at 3×10^8 m/s. How far does it travel in 5×10^2 seconds? Give your answer in standard form.

$$\begin{aligned} \text{Formula: } & \text{speed} \times \text{time} \\ & 3 \times 10^8 \times 5 \times 10^2 \\ = & 15 \times 10^{10} = 1.5 \times 10^{11} \text{ m} \\ & 1.5 \times 10^{11} \text{ m} \end{aligned}$$

Answer _____

2

A steel girder has a mass of 6×10^3 kg and a volume of 4×10^{-1} m³. Find its density in standard form.

$$\begin{aligned} \text{Formula: } & \text{mass} \div \text{volume} \\ & 6 \times 10^3 \div 4 \times 10^{-1} \\ = & 1.5 \times 10^4 = 1.5 \times 10^4 \text{ kg/m}^3 \\ & 1.5 \times 10^4 \text{ kg/m}^3 \end{aligned}$$

Answer _____

3

A force of 1.2×10^5 N acts on an area of 4×10^{-2} m². Find the pressure in standard form.

$$\begin{aligned} \text{Formula: } & \text{force} \div \text{area} \\ & 1.2 \times 10^5 \div 4 \times 10^{-2} \\ = & 0.3 \times 10^7 = 3 \times 10^6 \text{ N/m}^2 \\ & 3 \times 10^6 \text{ N/m}^2 \end{aligned}$$

Answer _____

4

A space probe travels 6×10^9 km at 4×10^4 km/h. How long does the journey take? Give your answer in standard form.

$$\begin{aligned} & 1.5 \times 10^5 = 1.5 \times 10^5 \text{ hours} \\ & 1.5 \times 10^5 \text{ hours} \end{aligned}$$

Answer _____

5

A grain of sand has a volume of 2×10^{-9} m³. Sand has a density of 2.5×10^3 kg/m³. Find the mass of the grain in standard form.

$$\text{mass} = \text{density} \times \text{volume} = 5 \times 10^{-6}$$

Answer 5×10^{-6} kg _____

6

Sound travels at 3.4×10^2 m/s. How many seconds does it take to travel 1.7×10^4 m? Give your answer as an ordinary number.

$$\text{time} = \text{distance} \div \text{speed} = 0.5 \times 10^2$$

Answer 50 seconds _____

7

A snail moves at 1.2×10^{-3} m/s. How far does it move in 1 hour? Give your answer as an ordinary number.

$$1 \text{ hour} = 3.6 \times 10^3 \text{ s: } 4.32 \times 10^0 = 4.32$$

Answer 4.32 m _____

8

Block A has a mass of 4.5×10^3 kg and a volume of 1.5 m³. Block B has a mass of 8×10^2 kg and a volume of 2×10^{-1} m³. Which block is denser?

$$A: 3 \times 10^3 \text{ kg/m}^3, B: 4 \times 10^3 \text{ kg/m}^3$$

Answer B _____

Standard form and compound measures further practice

ANSWERS

9

Light travels at 3×10^8 m/s. The Sun is 1.5×10^{11} m from the Earth. How many seconds does sunlight take to reach the Earth?

$$1.5 \times 10^{11} \div 3 \times 10^8 = 0.5 \times 10^3$$

Answer 500 seconds _____

10

A raindrop has a mass of 4×10^{-6} kg and a volume of 4×10^{-9} m³. Find the density of the water in standard form.

$$\text{the powers: } -6 - (-9) = 3$$

Answer $1 \times 10^3 \text{ kg/m}^3$ _____

11

A press puts a pressure of 2.5×10^6 N/m² on an area of 8×10^{-3} m². Find the force in standard form.

$$\text{force} = \text{pressure} \times \text{area} = 20 \times 10^3$$

Answer $2 \times 10^4 \text{ N}$ _____

12

A cell is 1.2×10^{-7} m long. It moves at 3×10^{-8} m/s. How long does it take to move its own length?

$$0.4 \times 10^1$$

Answer 4 seconds _____

13

A satellite moves at 7.5×10^3 m/s. There are 8.64×10^4 seconds in a day. How far does it travel in a day? Give your answer in standard form.

$$7.5 \times 8.64 = 64.8, \text{ so } 64.8 \times 10^7$$

Answer $6.48 \times 10^8 \text{ m}$ _____

14

A metal cube has sides of 2×10^{-2} m and a mass of 6.4×10^{-2} kg. Find its density in standard form.

$$\text{volume} = (2 \times 10^{-2})^3 = 8 \times 10^{-6} \text{ m}^3$$

Answer $8 \times 10^3 \text{ kg/m}^3$ _____

15

The Moon has a mass of 7.2×10^{22} kg and an average density of 3×10^3 kg/m³. Find its volume in standard form.

$$\text{volume} = \text{mass} \div \text{density}$$

Answer $2.4 \times 10^{19} \text{ m}^3$ _____

16

A signal travels 6×10^8 m in 2×10^3 seconds. Ana says its speed is 3×10^{11} m/s. Explain her mistake and find the speed.

$$\text{she added the powers; dividing subtracts them: } 8 - 3 = 5$$

Answer $3 \times 10^5 \text{ m/s}$ _____