Exercise 3

Paper 2 style · Graphic display calculator

3 6 marks SL 1.1 ●●○ Typical

The mean distance from Mars to the Sun is 2.279×10^8 km. Light travels at 3.00×10^5 km per second.

(a) Find the time, in seconds, that light takes to travel from the Sun to Mars. Give your answer in standard form. **[2]**

(b) Assume Mars moves around the Sun on a circle of radius 2.279×10^8 km. Find the length of one orbit, in standard form. **[2]**

(c) One orbit takes 687 days. Find the mean speed of Mars, in km per hour, in standard form. **[2]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

$\dfrac{2.279 \times 10^8}{3 \times 10^5}$ **(M1)**

7.60×10^2 s $(759.666\ldots)$ **A1**

Total 2 marks

MARKSCHEME (b)

$2\pi \times 2.279 \times 10^8$ **(M1)**

1.43×10^9 km $(1.43193\ldots \times 10^9)$ **A1**

Total 2 marks

MARKSCHEME (c)

$\dfrac{1.43193\ldots \times 10^9}{687 \times 24}$ **(M1)**

8.68×10^4 km/h $(86\,847\ldots)$ **A1**

Total 2 marks

Note $687 \times 24 = 16\,488$ hours.