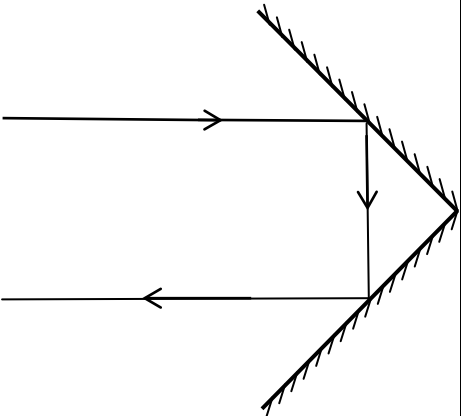




# Mark Scheme (Results)

## January 2015

### International GCSE Physics (4PH0 1P)

Question number	Answer	Notes	Marks
15 (a)	<p>Reflection at first surface correct; Ray emerges parallel;</p> 	Judge diagram by eye	2
(b)	<p>rearrangement and correct substitution; factor of 2 taken into account; value given to at least 2 significant figures;</p> <p>e.g.  Time to reach moon = <math>\frac{1}{2} \times 2.6 = 1.3</math> (s)  Distance = time <math>\times</math> speed = <math>1.3 \times 300\,000</math>  = 390 000 (km)</p> <p>OR</p> <p>Total distance = <math>2.6 \times 300\,000 = 780\,000</math>  So distance to moon = <math>\frac{1}{2} \times 780\,000</math>  = 390 000 (km)</p>	<p>working must be shown</p> <p>Reverse argument (starting with 400000 km) allow 2 max</p>	3

Question number	Answer	Notes	Marks
15	(c) (i) Any three of - MP1. idea that distance from Earth to Moon varies; MP2. idea that orbit of Moon is not (quite) circular; MP3. idea that change is cyclic / is regular / takes (about) a month; MP4. idea that Earth is not (quite) at centre of (moon) orbit; MP5. appropriate <u>use</u> of time data; MP6. appropriate calculation of a distance;	allow • further/nearer  • orbit elliptical • orbit radius varies • sinusoidal • 26.5 / 27 days  E.g. largest time difference = $2.70 - 2.47 = 0.23$ s e.g. $\Delta s = \frac{1}{2} \times ct$ = $\frac{1}{2} \times 3 \times 10^8 \times 0.23$ = 34 500 km	3
	(ii) Any one of - MP1. (average) moon orbit radius becomes larger; MP2. moon moving away (from Earth); MP3. gravitational force (or gravity) becoming weaker;	Allow reverse argument	1

Total 9 marks