

27th July

Higher 5-a-day



Corbettmaths

Solve $2x^2 - 5x - 1 = 0$ using the quadratic formula.

$a = 2 \quad b = -5 \quad c = -1$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{5 \pm \sqrt{25 - (-8)}}{4}$$

$$x = \frac{5 \pm \sqrt{33}}{4}$$

$x = 2.69$ or $x = -0.19$

Calculate an estimate of the mean length.

$$1789.5 \div 227$$

7.88 cm

Length, L cm	Frequency	fL
$0 \leq L < 3$ 1.5	21	31.5
$3 \leq L < 6$ 4.5	19	85.5
$6 \leq L < 9$ 7.5	100	750
$9 \leq L < 12$ 10.5	84	882
$12 \leq L < 15$ 13.5	3	40.5
	227	1789.5

The distance of the moon to the Earth is 384,400 km. 384400000 m
The speed of light is $2.998 \times 10^8 \text{ m/s}$.

$$s = \frac{d}{t} \quad \frac{384400000}{2.998 \times 10^8}$$

1.282 seconds

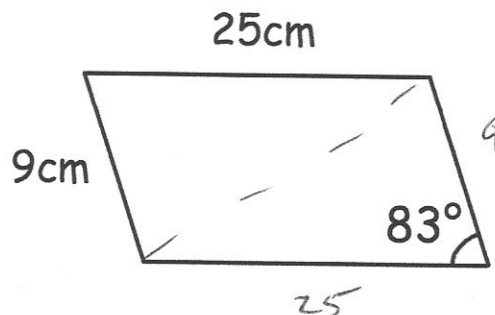
Work out how long it will take light to travel from the moon to the Earth. Include suitable units.

Shown is a parallelogram. Find the area of the parallelogram.

$$\frac{1}{2} \times 9 \times 25 \times \sin 83$$

$$= 111.6614 \dots \text{ cm}^2$$

$$111.6614 \dots \times 2 = 223.3 \text{ cm}^2$$



The population of New Zealand is 5 million, to the nearest million. The land area of New Zealand is 270000 km^2 to the nearest 10000 km^2

$$\text{Population density} = \frac{\text{Population}_{\text{min}}}{\text{Area}_{\text{max}}}$$

Work out the lower bound for the population density.

$$\frac{4,500,000}{275,000}$$

$16.364 \text{ people / km}^2$