

## 7G Modelling with Trigonometry

Expression	Maximum	(Smallest) $\theta$ at max
$20 \sin \theta$		
$5 - 10 \sin \theta$		
$3 \cos(\theta + 20^\circ)$		
$\frac{2}{10 + 3 \sin(\theta - 30)}$		

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- The cabin pressure,  $P$ , in pounds per square inch (psi) on an aeroplane at cruising altitude can be modelled by the equation:

$$P = 11.5 - 0.5 \sin(t - 2)$$

*\*note these formulae are often a result of reducing to  $R \cos(x+a)$  form*

Where  $t$  is the time in hours since the cruising altitude was first reached, and all angles are measured in radians

- State the minimum and maximum cabin pressure
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- Find the time after reaching cruising altitude that the cabin first reaches a maximum pressure

c) Calculate the cabin pressure after 5 hours at a cruising altitude

d) Find all the times during the first 8 hours of cruising that the cabin pressure would be exactly 11.3 psi.