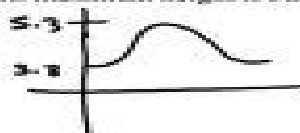


## Sinusoidal Word Problems

1. The height of the tip of an airplane propeller above the ground, once the engines reach full speed, can be modelled by a sinusoidal function. The propeller makes 200 revolutions per second. At  $t=0$  the tip of the propeller is at a minimum height above the ground at 3.8m. Its maximum height is 5.3m. Model this with an equation.



200 rps

$$\text{amp } \frac{(5.3 - 3.8)}{2} = 0.75$$

$$\text{axis } \frac{5.3 + 3.8}{2} = 4.55$$

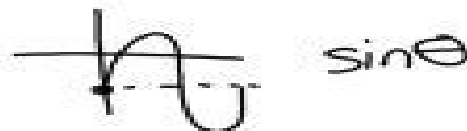
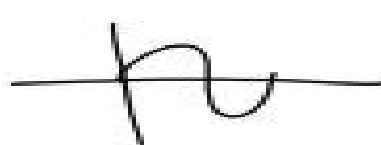
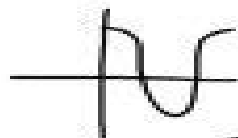
200 rev take 1 sec

$$1 \text{ rev } 1 \div 200 = 0.005 \text{ period}$$

$$\frac{360}{k} = 0.005$$

$$k = \frac{360}{0.005} = 72000$$

$$h(t) \leftarrow y = -0.75 \cos 72000t + 4.55$$



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**Francis BEAUVAIS**



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