

# ST. JEAN DE BREBEUF MATHEMATICS



## CHAPTER 8.4



## SOLVE PROBLEMS INVOLVING QUADRATIC RELATIONS

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## EXAMPLE The Trajectory of a Model Rocket

A model rocket is launched from a platform. The trajectory of the rocket can be modelled by the relation  $h = -5t^2 + 100t + 1$ , where  $h$  is the height of the model rocket in metres and  $t$  is the time in seconds.



(a) What is the height if the platform?

To solve for the height, we let  $t = \underline{0}$  and solve for  $h$

$$\begin{aligned}h &= -5t^2 + 100t + 1 \\ &= -5(0)^2 + 100(0) + 1 \\ &= \mathbf{1 \text{ metre}}\end{aligned}$$

The height of the platform is **1 metre**



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(b) What is the height of the rocket after 5 seconds?

Substitute  $t = 5$  and solve for  $h$

$$\begin{aligned}h &= -5t^2 + 100t + 1 \\ &= -5(5)^2 + 100(5) + 1 \\ &= 376 \text{ metres}\end{aligned}$$

The rocket is 376 metres in the air after 5 seconds.



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## Homework:

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#1a, 2 (omit e), 4 (omit e), 7a



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