

- 10.** A spherical mint of radius 5 mm is placed in the mouth and sucked.  
Four minutes later, the radius of the mint is 3 mm.

In a simple model, the rate of decrease of the radius of the mint is inversely proportional to the square of the radius.

Using this model and all the information given,

- (a) find an equation linking the radius of the mint and the time.  
(You should define the variables that you use.)

**(5)**

- (b) Hence find the total time taken for the mint to completely dissolve. Give your answer in minutes and seconds to the nearest second.

**(2)**

- (c) Suggest a limitation of the model.

**(1)**