

16. Figure 9.1 shows a paper cup in the form of a right circular cone of base radius 4 cm and height 8 cm. Two spherical ice-cream balls of radii 2 cm and  $x$  cm respectively are put into the cup. The ice-cream balls then completely melt into a liquid form. The depth of the liquid in the cup is  $(2x + 3)$  cm when the axis of the cup is vertical. (Assume the volume of ice-cream does not change on melting.)

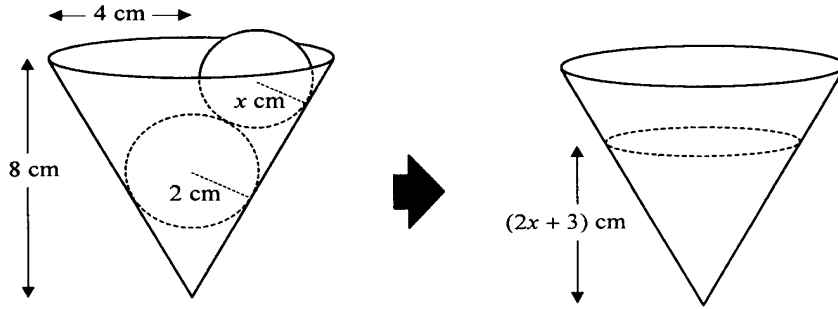


Figure 9.1

- (a) Show that  $8x^3 - 36x^2 - 54x + 101 = 0$ . (7 marks)
- (b) Figure 9.2 shows the graph of  $y = 2x^3 - 9x^2$  for  $x \geq 0$ . By adding a suitable straight line to the graph, find  $x$  correct to 1 decimal place. (4 marks)

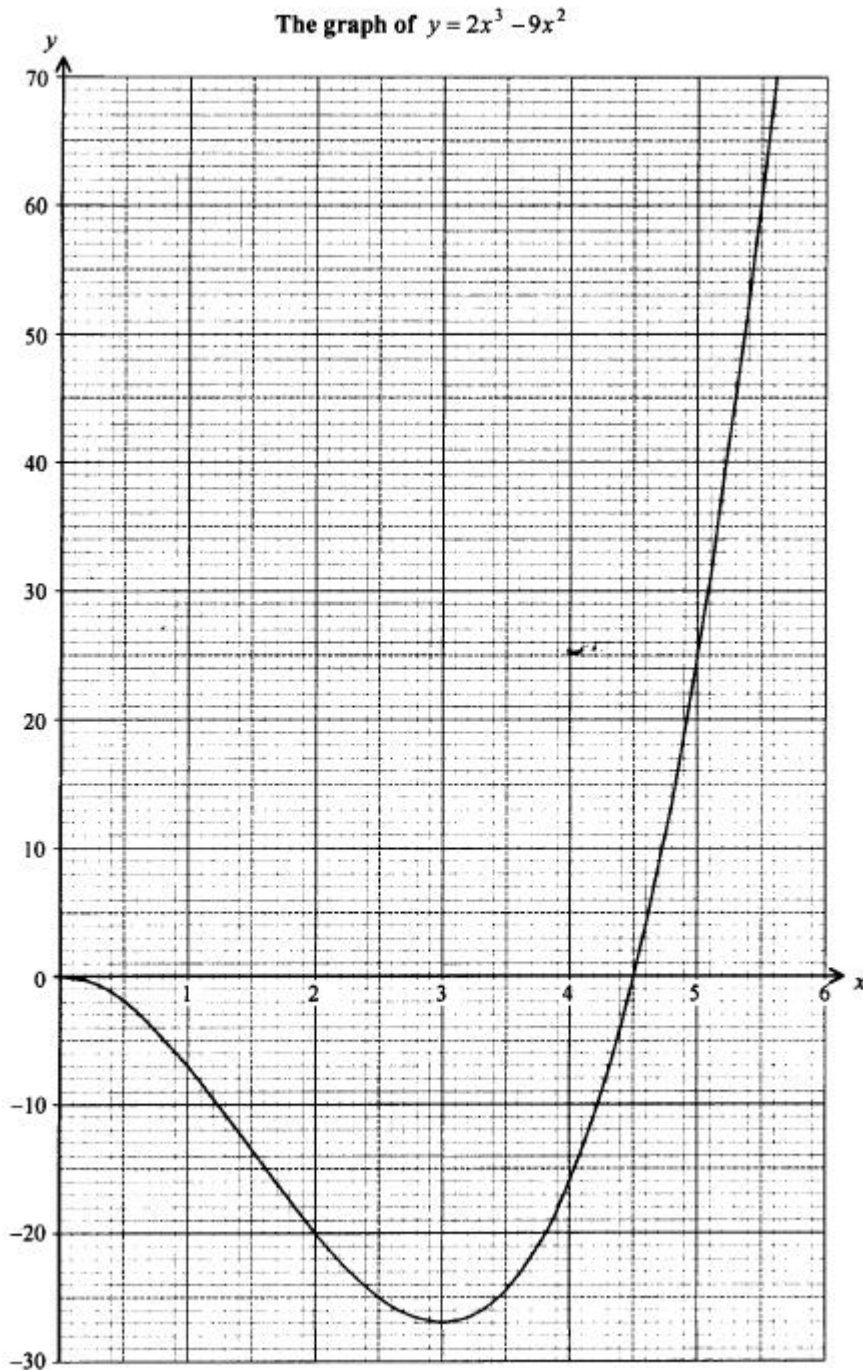


Figure 9.2