10.

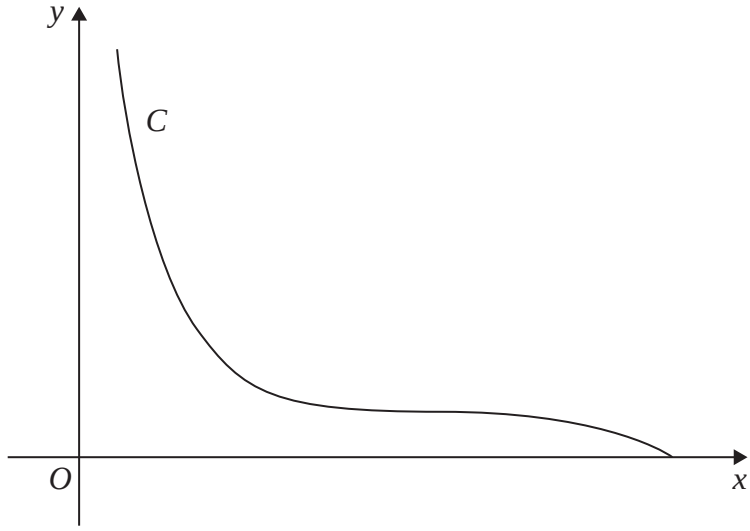

Figure 4

Figure 4 shows a sketch of the curve C with parametric equations

$$x = (t+3)^2 \qquad y = 1 - t^3 \qquad -2 \leqslant t \leqslant 1$$

The point P with coordinates (4, 2) lies on C.

(a) Using parametric differentiation, show that the tangent to C at P has equation

$$3x + 4y = 20$$

(5)

The curve C is used to model the profile of a slide at a water park.

Units are in metres, with y being the height of the slide above water level.

(b) Find, according to the model, the greatest height of the slide above water level.

(1)