4. (a) Determine the general solution of the differential equation

$$x\frac{\mathrm{d}y}{\mathrm{d}x} + 2y = 12x^2\sqrt{x^4 + 9} \qquad x > 0$$

giving the answer in the form $y = \mathrm{f}(x)$.

(5)

Given that $y = \frac{715}{12}$ at $x = 2$

(b) determine the particular solution of the differential equation, giving the answer in the form $y = \mathrm{g}(x)$.

(2)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 4 continued

Question 4 continued

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 4 continued

(Total for Question 4 is 7 marks)