IMPLICIT Differentiation 2 : Answers

2005 3. $8x + 3y + 3x\frac{dy}{dx} - 2y\frac{dy}{dx} = 0$ B1 $(2y\frac{dy}{dx})$

B1 $(3y + 3x\frac{dy}{dx})$

$\frac{dy}{dx} = \frac{8x + 3y}{2y - 3x}$

$= -\frac{19}{4}$ B1 (CAO)

Equation is $y - 1 = -\frac{19}{4}(x - 2)$ B1 (FT one slip)

2006 2. $6x^2 + 6y^2 + 12xy\frac{dy}{dx} - 4y^2\frac{dy}{dx} = 0$

B1 $(4y^3\frac{dy}{dx})$

B1 $(6y^2 + 12xy\frac{dy}{dx})$

$\frac{dy}{dx} = -\frac{3}{2}$

B1 (C.A.O.)

Gradient of normal $= \frac{3}{2}$

M1 (F.T. candidate's $\frac{dy}{dx}$)

Equation is $y - 1 = \frac{2}{3}(x - 2)$

A1 (F.T. candidate's gradient of normal)

5

2007 2. $5x^4 + y^2 + 2xy\frac{dy}{dx} + 3y^2\frac{dy}{dx} = 0$

B1 $(y^2 + 2xy\frac{dy}{dx})$

B1 $(3y^2\frac{dy}{dx})$

$\frac{dy}{dx} = -\frac{2}{3}$ (o.e.)

B1 (C.A.O.)

Equation is $y - 3 = -\frac{2}{3}(x + 1)$

B1 (F.T. candidate's $\frac{dy}{dx}$)

4

2008 2. $2x + x\frac{dy}{dx} + y + 4y\frac{dy}{dx} = 0$

B1 $(x\frac{dy}{dx} + y)$

B1 $(4y\frac{dy}{dx})$

$\frac{dy}{dx} = 5$

B1 (C.A.O.)

Gradient of normal $= -\frac{1}{5}$

M1 $(\frac{-1}{\text{candidate's } \frac{dy}{dx}}$, numerical value)

Equation of normal is $y - 1 = -\frac{1}{5}(x + 3)$

A1 (F.T. candidate's value)