

**Answers – no process work - only simplified answers****Gateway 3A**

1) 
$$\frac{dy}{dx} = \frac{3x(x-2)}{(x-1)^2}$$

3) 
$$\frac{dy}{dx} = -4ke^{kt} \cos^3(e^{kt}) \sin(e^{kt})$$

5) 
$$\frac{dy}{dx} = \frac{-12x}{\sqrt{1-4x^4}}$$

7) 
$$\frac{dy}{dx} = \frac{-10x}{1+(5-5x^2)^2}$$

9) 
$$\frac{dy}{dx} = \frac{x^2 - 10x - 5}{(5+x^2)^2}$$

2) 
$$\frac{dy}{dx} = 2^{3x+1} (1+x \ln 8)$$

4) 
$$\frac{dy}{dx} = \frac{2(x-2)}{x(x-4)}$$

6) 
$$\frac{dy}{dx} = 3\pi x^{\pi-1} - 2x - kx^{k-1}$$

8) 
$$\frac{dy}{dx} = 3e^{3x} (x)(3x+2)$$

10) 
$$\frac{dy}{dx} = \frac{2+3x^2}{2\sqrt{1+2x+x^3}}$$