

$$\begin{aligned} \text{b. } y &= \int 1 - \frac{3}{x^2} dx = \int 1 - 3x^{-2} dx \\ &= x - \frac{3x^{-1}}{-1} + C \\ &= x + 3x^{-1} + C \\ y &= x + \frac{3}{x} + C \end{aligned}$$

$$\underline{y = x + \frac{3}{x} + 2}$$

$$\text{sub } \begin{pmatrix} 3, 6 \\ x, y \end{pmatrix}$$

$$6 = 3 + \frac{3}{3} + C$$

$$6 = 3 + 1 + C$$

$$C = 2$$

Question			Generic scheme	Illustrative scheme	Max mark
6.			•¹ write in integrable form •² integrate one term •³ complete integration •⁴ interpret information given and substitute for x and y •⁵ state expression for y	•¹ $1 - 3x^{-2}$ •² x or $\dots - \frac{3x^{-1}}{-1}$ •³ $\dots - \frac{3x^{-1}}{-1} + c$ or $x \dots + c$ •⁴ $6 = 3 + 3(3)^{-1} + c$ •⁵ $y = x + 3x^{-1} + 2$	5
Notes:					
1. For candidates who make no attempt to integrate only • ¹ is available. 2. For candidates who omit $+c$ only • ¹ and • ² are available. 3. For candidates who differentiate either term, • ³ , • ⁴ , and • ⁵ are not available.					
Commonly Observed Responses:					
Candidate A - incomplete substitution			Candidate B - partial integration		
$y = x + 3x^{-1} + c$ • ¹ ✓ • ² ✓ • ³ ✓ $y = 3 + 3(3)^{-1} + c$ $c = -4$ • ⁴ ^ $y = x + 3x^{-1} - 4$ • ⁵ ✓ 1			$y = 1 + 3x^{-1} + c$ • ¹ ✓ • ² ✓ • ³ ✗ $6 = 1 + 3(3)^{-1} + c$ • ⁴ ✓ 1 $c = 4$ $y = x + 3x^{-1} + 4$ • ⁵ ✓ 1		
Candidate C - inconsistent working			Candidate D - inconsistent working		
$\frac{dy}{dx} = 1 - \frac{3}{x^2}$ $x - 3x^{-2}$ • ¹ ✗ $y = x - \frac{3x^{-1}}{-1} + c$ • ² ✓ 1 • ³ ✓ 1			$\frac{dy}{dx} = 1 - \frac{3}{x^2}$ $x - 3x^{-2}$ • ¹ ✗ $y = \frac{x^2}{2} - \frac{3x^{-1}}{-1} + c$ • ² ✓ 1 • ³ ✓ 1		
Candidate E					
integration not complete at • ³ stage $\frac{dy}{dx} = 1 - 3x^{-2}$ • ¹ ✓ $y = x - \frac{3x^{-1}}{-1}$ • ² ✓ • ³ ✗ $y = x + 3x^{-1} + c$					