solving differential equations

[SQA] 1. The graph of $y = g(x)$ passes through the point $(1, 2)$.

If $\frac{dy}{dx} = x^3 + \frac{1}{x^2} - \frac{1}{4}$, express y in terms of x. **4**

[SQA] 2. For all points on the curve $y = f(x)$, $f'(x) = 1 - 2x$.

If the curve passes through the point $(2, 1)$, find the equation of the curve. **4**

[SQA] 3. A curve with equation $y = f(x)$ passes through the point $(2, -1)$ and is such that $f'(x) = 4x^3 - 1$.

Express $f(x)$ in terms of x. **5**

[SQA] 4. A curve for which $\frac{dy}{dx} = 3x^2 + 1$ passes through the point $(-1, 2)$.

Express y in terms of x. **4**

[SQA] 5. A curve for which $\frac{dy}{dx} = 6x^2 - 2x$ passes through the point $(-1, 2)$.

Express y in terms of x. **3**

[SQA] 6. The graph of $y = f(x)$ passes through the point $\left(\frac{\pi}{9}, 1\right)$.

If $f'(x) = \sin(3x)$ express y in terms of x. **4**

[SQA] 7. A curve for which $\frac{dy}{dx} = 3\sin(2x)$ passes through the point $\left(\frac{5\pi}{12}, \sqrt{3}\right)$.

Find y in terms of x. **4**

[END OF QUESTIONS]