

differentiation

- [SQA] 1. Functions f and g are given by $f(x) = 3x + 1$ and $g(x) = x^2 - 2$.
- (a) (i) Find $p(x)$ where $p(x) = f(g(x))$. 3
- (ii) Find $q(x)$ where $q(x) = g(f(x))$. 3
- (b) Solve $p'(x) = q'(x)$. 3
- [SQA] 2. If $y = x^2 - x$, show that $\frac{dy}{dx} = 1 + \frac{2y}{x}$. 3
- [SQA] 3. Given $f(x) = 3x^2(2x - 1)$, find $f'(-1)$. 3
- [SQA] 4. Find $\frac{dy}{dx}$ where $y = \frac{4}{x^2} + x\sqrt{x}$. 4
- [SQA] 5. Find $f'(4)$ where $f(x) = \frac{x-1}{\sqrt{x}}$. 5
- [SQA] 6. Given that $y = 2x^2 + x$, find $\frac{dy}{dx}$ and hence show that $x \left(1 + \frac{dy}{dx}\right) = 2y$. 3
- [SQA] 7. Differentiate $2\sqrt{x}(x+2)$ with respect to x . 4
- [SQA] 8. If $f(x) = kx^3 + 5x - 1$ and $f'(1) = 14$, find the value of k . 3
- [SQA] 9. If $f(x) = \cos^2 x - \frac{2}{3x^2}$, find $f'(x)$. 4
- [SQA] 10. Differentiate $4\sqrt{x} + 3 \cos 2x$ with respect to x . 4
- [SQA] 11. Differentiate $\sin 2x + \frac{2}{\sqrt{x}}$ with respect to x . 4

[END OF QUESTIONS]