Answers

Essential Skills 25	
1	$y = 3x^2 + 5x - 1$
2	$y = 2x^2 - 4x$
3	$f(x) = \frac{1}{3}x^3 + 4$
4	$f(x) = x^3 - 6x + 5$
5	$y = 2x^3 + 4x^2 + 5x - 2$
6	$f(x) = 4x - 3x^2$
7	$y = \frac{3}{2}x^3 - 3x^2 + 3$
8	$y = 3 - \frac{2}{x^2}$
9	$y = (3x - 5)^3 + 5$
10	$f(x) = 3sin2x + 1$
AQ	(1) $y = 2x^3 - \frac{3}{2}x^2 + \frac{27}{2}$ (2) $s = 6\sqrt{t^3} - 12t + 2$

Essential Skills 26	
1	-2
2	27
3	$\frac{14}{3}$
4	$\frac{2}{3}$
5	$\frac{3}{4}$
6	14
7	$\frac{8}{3}$
8	$\frac{63}{8}$
9	$\frac{4}{3}$
10	$\frac{1-\sqrt{3}}{4}$
AQ	(1) $\frac{1}{3}$ units^2 (2) p = 3

Essential Skills 27	
1	$f(g(x)) = 11 - 16x$ $g(f(x)) = -16x - 5$
2	$f(g(x)) = x^2 + 2x + 1$ $g(f(x)) = 1 + x^2$
3	$f(g(x)) = 12x + 1$ $g(f(x)) = 12x + 2$
4	$f(g(x)) = 4x^2 - 12x + 8$ $g(f(x)) = 2x^2 - 5$
5	$f(g(x)) = \frac{1+5x}{5}$ $g(f(x)) = \frac{1}{x+5}$
6	$f(g(x)) = x^2 + x$ $g(f(x)) = x^2 + 3x + 1$
7	$f(g(x)) = x$ $g(f(x)) = x$
8	$f(g(x)) = \frac{x-1}{x-3}$ $g(f(x)) = \frac{1}{2x-2}$
9	$f(g(x)) = \sin(6x - 1)$ $g(f(x)) = 6sinx - 1$
10	$f(g(x)) = \cos(2x^2 - 1)$ $g(f(x)) = cos2x$
AQ	(1) $h(x) = \frac{1}{x^2-6x+8}, x \neq 2,4$ (2) $f(f(x)) = \frac{1+x}{2+x}$

Essential Skills 28	
1	$f^{-1}(x) = \frac{x-1}{6}$
2	$f^{-1}(x) = 6 - x$
3	$f^{-1}(x) = 3(x + 2)$
4	$f^{-1}(x) = \frac{5(x+1)}{2}$
5	$f^{-1}(x) = 3x - 5$
6	$f^{-1}(x) = \sqrt[3]{x+8}$
7	$f^{-1}(x) = x^2 + 1$
8	$f^{-1}(x) = \sqrt[3]{\frac{x-1}{2}}$
9	$f^{-1}(x) = \frac{3}{x}$
10	$f^{-1}(x) = \frac{3x-2}{x}$
AQ	(1) $f^{-1}(x) = \frac{1+3x}{x-1}$, $x \neq 1$ (2) Inverse needs the domain restriction to work (3) Suitable curve reflected in $y = x$