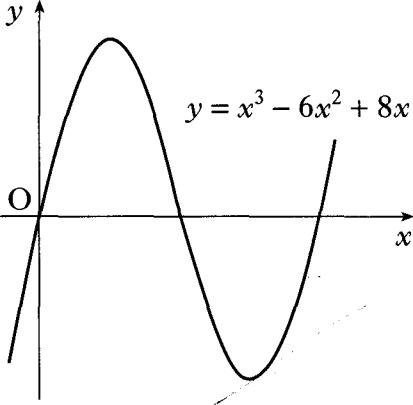
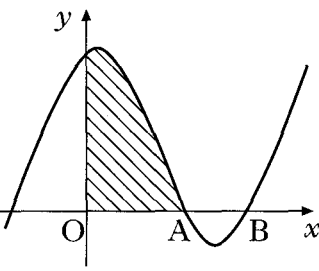
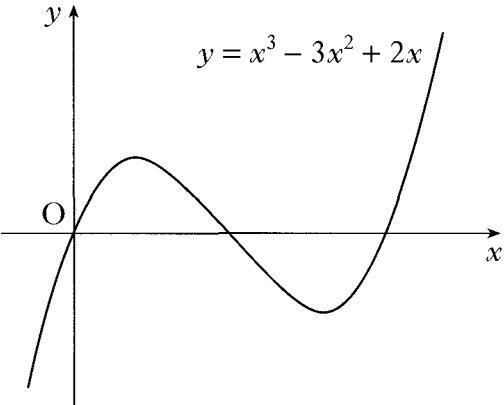




Polynomials

2008 P1	<p>21. A function f is defined on the set of real numbers by $f(x) = x^3 - 3x + 2$.</p> <p>(a) Find the coordinates of the stationary points on the curve $y = f(x)$ and determine their nature.</p> <p>(b) (i) Show that $(x - 1)$ is a factor of $x^3 - 3x + 2$. (ii) Hence or otherwise factorise $x^3 - 3x + 2$ fully.</p> <p>(c) State the coordinates of the points where the curve with equation $y = f(x)$ meets both the axes and hence sketch the curve.</p>	6 5 4	
Ans			
2008 P1	<p>22. The diagram shows a sketch of the curve with equation $y = x^3 - 6x^2 + 8x$.</p> <p>(a) Find the coordinates of the points on the curve where the gradient of the tangent is -1.</p> <p>(b) The line $y = 4 - x$ is a tangent to this curve at a point A. Find the coordinates of A.</p>		5 2
Ans			
2007 P1	<p>8. The diagram shows a sketch of the graph of $y = x^3 - 4x^2 + x + 6$.</p> <p>(a) Show that the graph cuts the x-axis at $(3, 0)$.</p> <p>(b) Hence or otherwise find the coordinates of A.</p>		1 3

Ans		
2007 P2	<p>10. The diagram shows the graphs of a cubic function $y = f(x)$ and its derived function $y = f'(x)$.</p> <p>Both graphs pass through the point $(0, 6)$.</p> <p>The graph of $y = f'(x)$ also passes through the points $(2, 0)$ and $(4, 0)$.</p> <p>(a) Given that $f'(x)$ is of the form $k(x - a)(x - b)$:</p> <p>(i) write down the values of a and b;</p> <p>(ii) find the value of k.</p>	3
Ans		
2005 P1	<p>8. A function f is defined by the formula $f(x) = 2x^3 - 7x^2 + 9$ where x is a real number.</p> <p>(a) Show that $(x - 3)$ is a factor of $f(x)$, and hence factorise $f(x)$ fully.</p> <p>(b) Find the coordinates of the points where the curve with equation $y = f(x)$ crosses the x- and y-axes.</p> <p>(c) Find the greatest and least values of f in the interval $-2 \leq x \leq 2$.</p>	5 2 5
Ans		
2005 P2	<p>11. (a) Show that $x = -1$ is a solution of the cubic equation $x^3 + px^2 + px + 1 = 0$.</p> <p>(b) Hence find the range of values of p for which all the roots of the cubic equation are real.</p>	1 7
Ans		

2004 P1	<p>2. $f(x) = x^3 - x^2 - 5x - 3$.</p> <p>(a) (i) Show that $(x + 1)$ is a factor of $f(x)$. (ii) Hence or otherwise factorise $f(x)$ fully.</p> <p>(b) One of the turning points of the graph of $y = f(x)$ lies on the x-axis. Write down the coordinates of this turning point.</p>	5 1	
Ans			
2003 P2	<p>1. $f(x) = 6x^3 - 5x^2 - 17x + 6$.</p> <p>(a) Show that $(x - 2)$ is a factor of $f(x)$. (b) Express $f(x)$ in its fully factorised form.</p>	4	
Ans			
2002W P1	<p>5. Given that $(x - 2)$ and $(x + 3)$ are factors of $f(x)$ where $f(x) = 3x^3 + 2x^2 + cx + d$, find the values of c and d.</p>	5	
Ans			
2001 P2	<p>1. (a) Given that $x + 2$ is a factor of $2x^3 + x^2 + kx + 2$, find the value of k. (b) Hence solve the equation $2x^3 + x^2 + kx + 2 = 0$ when k takes this value.</p>	3 2	
Ans			
2000 P2	<p>1. The diagram shows a sketch of the graph of $y = x^3 - 3x^2 + 2x$.</p> <p>(a) Find the equation of the tangent to this curve at the point where $x = 1$.</p> <p>(b) The tangent at the point $(2, 0)$ has equation $y = 2x - 4$. Find the coordinates of the point where this tangent meets the curve again.</p>		5 5
Ans			

<i>Specimen 2 PI</i>	<p>1. Show that $x = 2$ is a root of the equation $y = 2x^3 + x^2 - 13x + 6 = 0$ and hence, or otherwise, find the other roots.</p>	4
<i>Ans</i>		
<i>Specimen 1 PI</i>	<p>3. (a) Show that $(x - 1)$ is a factor of $f(x) = x^3 - 6x^2 + 9x - 4$ and find the other factors.</p> <p>(b) Write down the coordinates of the points at which the graph of $y = f(x)$ meets the axes.</p>	3 1
<i>Ans</i>		