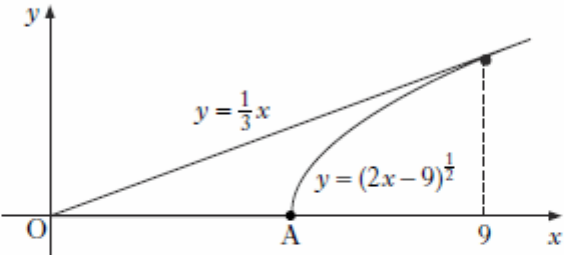
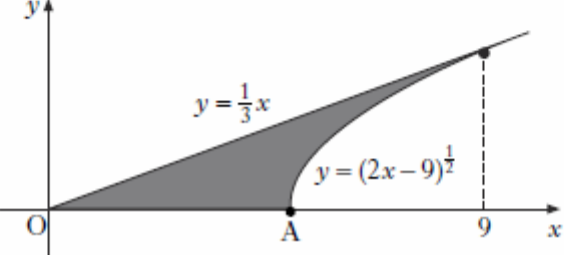
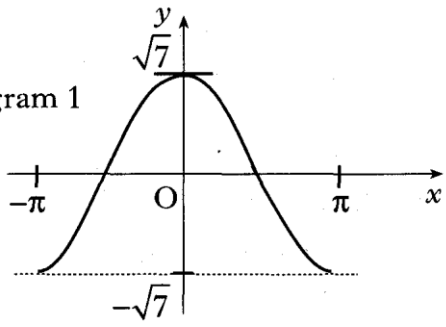
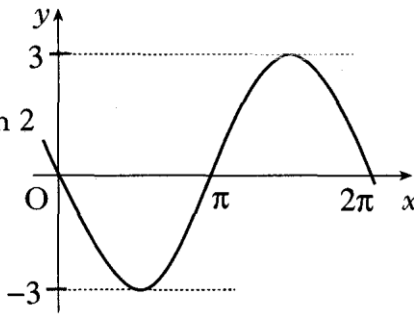


2010 P1	<p>9. Find <math>\int (2x^{-4} + \cos 5x) dx</math>.</p> <p>A <math>-\frac{2}{5}x^{-5} - 5\sin 5x + c</math></p> <p>B <math>-\frac{2}{5}x^{-5} + \frac{1}{5}\sin 5x + c</math></p> <p>C <math>-\frac{2}{3}x^{-3} + \frac{1}{5}\sin 5x + c</math></p> <p>D <math>-\frac{2}{3}x^{-3} - 5\sin 5x + c</math></p>	
Ans	C	
2010 P2	<p>6. (a) A curve has equation <math>y = (2x - 9)^{\frac{1}{2}}</math>. Show that the equation of the tangent to this curve at the point where <math>x = 9</math> is <math>y = \frac{1}{3}x</math>.</p> <p>(b) Diagram 1 shows part of the curve and the tangent.</p> <p>The curve cuts the <math>x</math>-axis at the point A.</p>  <p style="text-align: center;">Diagram 1</p> <p>Find the coordinates of point A.</p> <p>(c) Calculate the shaded area shown in diagram 2.</p>  <p style="text-align: center;">Diagram 2</p>	5 1 7
Ans	(b) $\left(\frac{9}{2}, 0\right)$ (c) 4.5	

2009 P1	<p><b>18.</b> Given that <math>f(x) = (4 - 3x^2)^{-\frac{1}{2}}</math> on a suitable domain, find <math>f'(x)</math>.</p> <p>A <math>-3x(4 - 3x^2)^{-\frac{1}{2}}</math></p> <p>B <math>-\frac{1}{2}(4 - 6x)^{-\frac{3}{2}}</math></p> <p>C <math>2(4 - 3x^3)^{\frac{1}{2}}</math></p> <p>D <math>3x(4 - 3x^2)^{-\frac{3}{2}}</math></p>	
Ans	D	
2008 P1	<p><b>15.</b> What is the derivative of <math>(x^3 + 4)^2</math>?</p> <p>A <math>(3x^2 + 4)^2</math></p> <p>B <math>\frac{1}{3}(x^3 + 4)^3</math></p> <p>C <math>6x^2(x^3 + 4)</math></p> <p>D <math>2(3x^2 + 4)^{-1}</math></p>	2
Ans	C	

2008 P2	<p>3. (a) (i) Diagram 1 shows part of the graph of <math>y = f(x)</math>, where <math>f(x) = p \cos x</math>. Write down the value of <math>p</math>.</p> <p>(ii) Diagram 2 shows part of the graph of <math>y = g(x)</math>, where <math>g(x) = q \sin x</math>. Write down the value of <math>q</math>.</p>	<p>Diagram 1</p>  <p>Diagram 2</p> 	2
Ans	(a) $p = \sqrt{7}$ , $q = -3$ (b) $4\cos(x+0.848)$ (c) $-4\sin(x+0.848)$		4
2007 P1	<p>10. Given that <math>y = \sqrt{3x^2 + 2}</math>, find <math>\frac{dy}{dx}</math>.</p>	3	
Ans	$\frac{1}{2}(3x^2 + 2)^{-\frac{1}{2}} \times 6x (= 3x(3x^2 + 2)^{-\frac{1}{2}})$		
2007 P2	<p>7. Find the value of <math>\int_0^2 \sin(4x+1) dx</math>.</p>	4	
Ans	0.36		
2006 P1	<p>5. A function <math>f</math> is defined by <math>f(x) = (2x - 1)^5</math>. Find the coordinates of the stationary point on the graph with equation <math>y = f(x)</math> and determine its nature.</p>	7	
Ans	point of inflexion at $(\frac{1}{2}, 0)$		
2006 P2	<p>9. If <math>y = \frac{1}{x^3} - \cos 2x</math>, <math>x \neq 0</math>, find <math>\frac{dy}{dx}</math>.</p>	4	

<i>Ans</i>	$-3x^{-1} + 2 \sin 2x$	
2005 P1	5. Differentiate $(1 + 2 \sin x)^4$ with respect to $x$ .	2
<i>Ans</i>	$4(1 + 2\sin(x))^3$ $\dots \times 2\cos(x)$	
2004 P1	6. Given that $y = 3\sin(x) + \cos(2x)$ , find $\frac{dy}{dx}$ .	3
<i>Ans</i>	$3\cos(x) - 2\sin(2x)$	
2004 P1	7. Find $\int_0^2 \sqrt{4x+1} dx$ .	5
<i>Ans</i>	$\frac{13}{3}$	
2003 P1	8. Find $\int_0^1 \frac{dx}{(3x+1)^{\frac{1}{2}}}$ .	4
<i>Ans</i>	$\frac{2}{3}$	
2003 P2	6. If $f(x) = \cos(2x) - 3 \sin(4x)$ , find the exact value of $f'\left(\frac{\pi}{6}\right)$ .	4
<i>Ans</i>	$6 - \sqrt{3}$	
2002W P1	10. A function $f$ is defined by $f(x) = 2x + 3 + \frac{18}{x-4}$ , $x \neq 4$ . Find the values of $x$ for which the function is increasing.	5
<i>Ans</i>	$f'(x) = 2 - \frac{18}{(x-4)^2}$ $f'(x) = 0 \Rightarrow x = 1, 7$ $f'(x) > 0 \Rightarrow x < 1, x > 7$	
2002W P2	8. Find $\int_0^1 \left(\cos(3x) - \sin\left(\frac{1}{3}x + 1\right)\right) dx$ correct to 3 decimal places.	3
<i>Ans</i>	$a = -0.868$	

2002 P1	10. (a) Find the derivative of the function $f(x) = (8 - x^3)^{\frac{1}{2}}$ , $x < 2$ .	2
	(b) Hence write down $\int \frac{x^2}{(8 - x^3)^{\frac{1}{2}}} dx$ .	1
Ans	(a) $f'(x) = -\frac{3}{2} x^2 (8 - x^3)^{-\frac{1}{2}}$ (b) $-\frac{2}{3} (8 - x^3)^{\frac{1}{2}} + c$	
2002 P2	6. Find the equation of the tangent to the curve $y = 2 \sin\left(x - \frac{\pi}{6}\right)$ at the point where $x = \frac{\pi}{3}$ .	4
Ans	$y = \sqrt{3}x + 1 - \frac{\pi}{\sqrt{3}}$	
2001 P2	10. A curve for which $\frac{dy}{dx} = 3 \sin(2x)$ passes through the point $\left(\frac{5}{12}\pi, \sqrt{3}\right)$ . Find $y$ in terms of $x$ .	4
Ans	$y = -\frac{3}{2} \cos(2x) + \frac{1}{4} \sqrt{3}$	
2000 P1	8. 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
Ans	$y = -\frac{1}{3} \cos(3x) + \frac{7}{6}$	
2000 P2	8. Given that $f(x) = (5x - 4)^{\frac{1}{2}}$ , evaluate $f'(4)$ .	3
Ans	$\frac{5}{8}$	
2000 P2	10. Find $\int \frac{1}{(7 - 3x)^2} dx$ .	2
Ans	$\frac{1}{3(7 - 3x)} + c$	
Specimen 1 P1	9. Find $\frac{dy}{dx}$ given that $y = \sqrt{1 + \cos x}$ .	3
Ans	$-\frac{1}{2} \sin x (1 + \cos x)^{-\frac{1}{2}}$	

