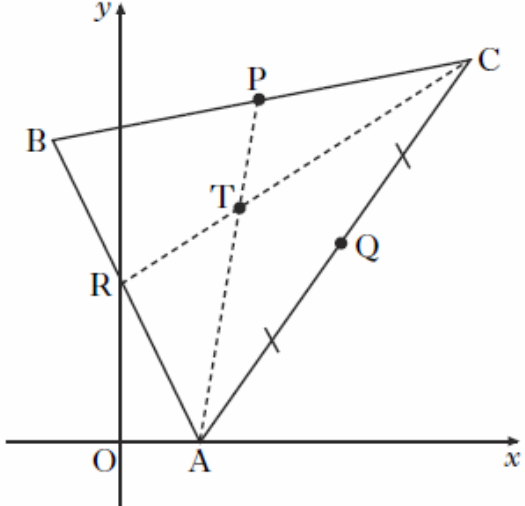
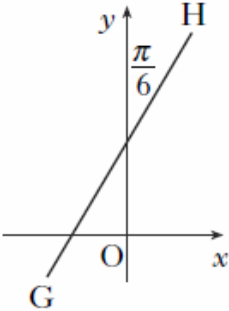
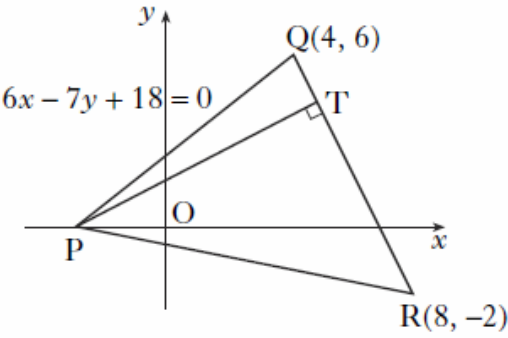


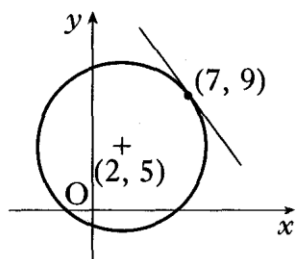
2010 PI	<p>1. A line L is perpendicular to the line with equation <math>2x - 3y - 6 = 0</math>. What is the gradient of the line L?</p> <p>A <math>-\frac{3}{2}</math> B <math>-\frac{1}{2}</math> C <math>\frac{2}{3}</math> D 2</p>	
Ans	A	
2010 PI	<p>21. Triangle ABC has vertices A(4, 0), B(-4, 16) and C(18, 20), as shown in the diagram opposite.</p> <p>Medians AP and CR intersect at the point T(6, 12).</p>  <p>(a) Find the equation of median BQ.</p> <p>(b) Verify that T lies on BQ.</p> <p>(c) Find the ratio in which T divides BQ.</p>	3 1 2
Ans	<p>(a) <math>y - 16 = -\frac{2}{5}(x - (-4))</math> or <math>y - 10 = -\frac{2}{5}(x - 11)</math>  (b) e.g. Substitution : <math>2(6) + 5(12) = 12 + 60 = 72</math>  (c) 2:1</p>	

2009 P1	<p>3. Triangle PQR has vertices at P(-3, -2), Q(-1, 4) and R(3, 6). PS is a median. What is the gradient of PS?</p> <p>A -2</p> <p>B <math>-\frac{7}{4}</math></p> <p>C 1</p> <p>D <math>\frac{7}{4}</math></p>	
Ans	D	
2009 P1	<p>5. Here are two statements about the points S(2, 3) and T(5, -1):</p> <p>(1) The length of ST = 5 units;</p> <p>(2) The gradient of ST = <math>\frac{4}{3}</math>.</p> <p>Which of the following is true?</p> <p>A Neither statement is correct.</p> <p>B Only statement (1) is correct.</p> <p>C Only statement (2) is correct.</p> <p>D Both statements are correct.</p>	
Ans	B	

2009 P1	<p>15. The line GH makes an angle of <math>\frac{\pi}{6}</math> radians with the <math>y</math>-axis, as shown in the diagram. What is the gradient of GH?</p>  <p>A <math>\sqrt{3}</math>  B <math>\frac{1}{2}</math>  C <math>\frac{1}{\sqrt{2}}</math>  D <math>\frac{\sqrt{3}}{2}</math></p>	
Ans	A	
2009 P1	<p>21. Triangle PQR has vertex P on the <math>x</math>-axis, as shown in the diagram. Q and R are the points (4, 6) and (8, -2) respectively. The equation of PQ is <math>6x - 7y + 18 = 0</math>.</p> <p>(a) State the coordinates of P.</p> <p>(b) Find the equation of the altitude of the triangle from P.</p> <p>(c) The altitude from P meets the line QR at T. Find the coordinates of T.</p> 	1 3 4
Ans	<p>(a) P(-3,0)  (b) <math>alt : y - 0 = \frac{1}{2}(x + 3)</math>  (c) T(5,4)</p>	

5. The diagram shows a circle, centre (2, 5) and a tangent drawn at the point (7, 9). What is the equation of this tangent?

2



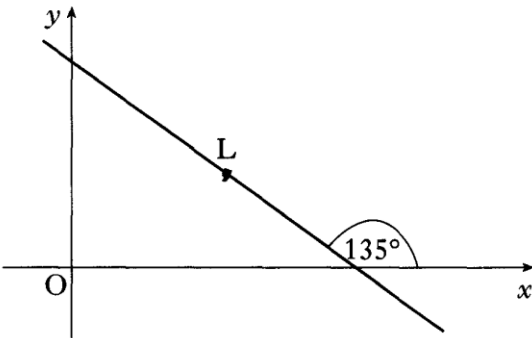
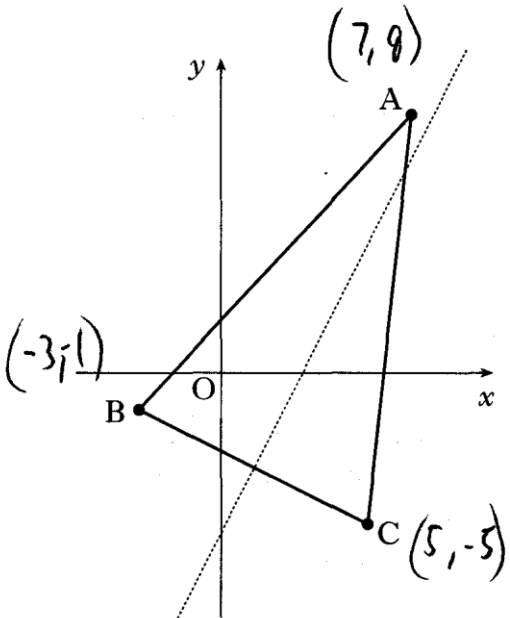
A  $y - 9 = -\frac{5}{4}(x - 7)$

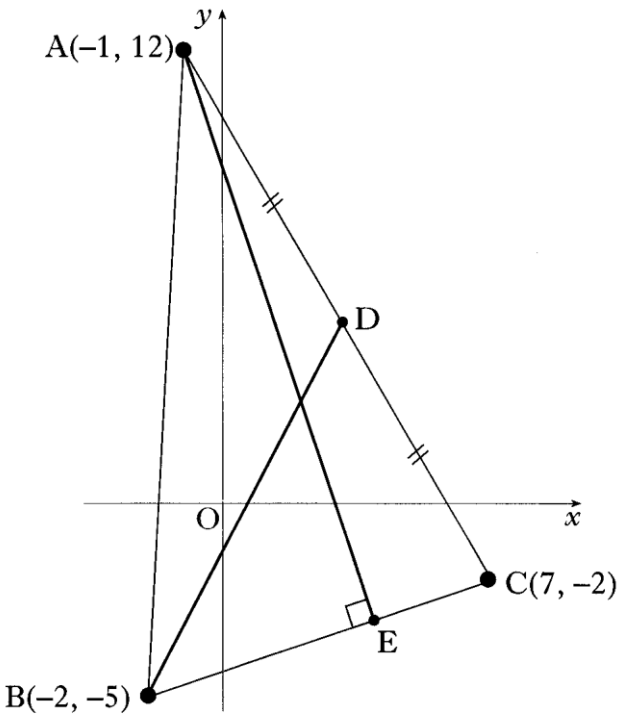
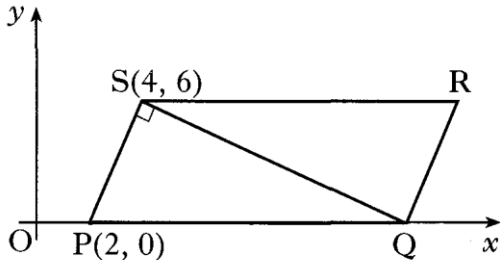
B  $y + 9 = -\frac{4}{5}(x + 7)$

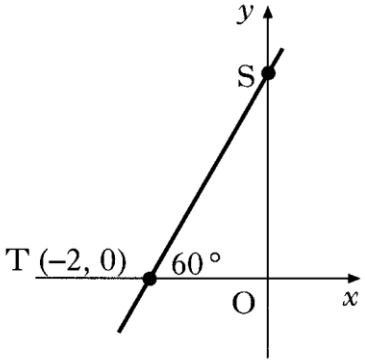
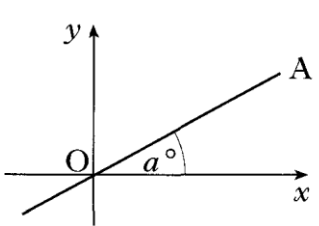
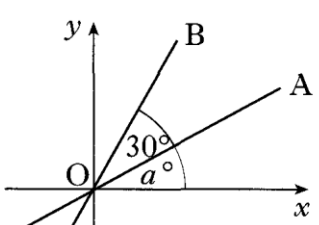
C  $y - 7 = \frac{4}{5}(x - 9)$

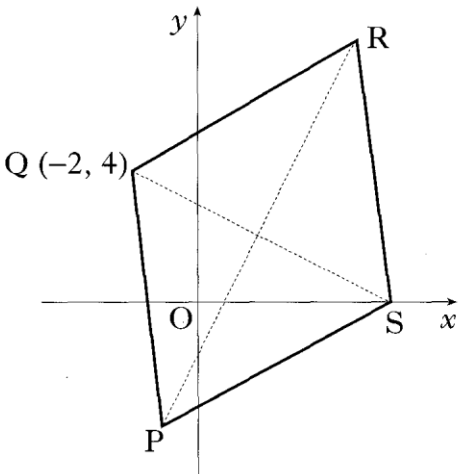
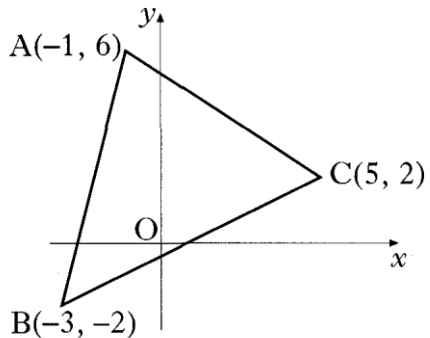
D  $y + 9 = \frac{5}{4}(x + 7)$

Ans A

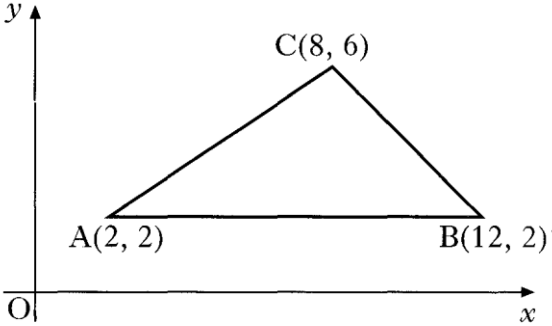
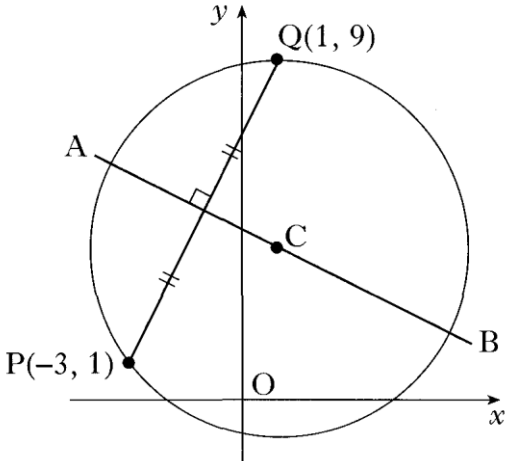
2008 P1	<p>7. The diagram shows a line L; the angle between L and the positive direction of the x-axis is <math>135^\circ</math>, as shown.</p>  <p>What is the gradient of line L?</p> <p>A <math>-\frac{1}{2}</math></p> <p>B <math>-\frac{\sqrt{3}}{2}</math></p> <p>C <math>-1</math></p> <p>D <math>\frac{1}{2}</math></p>	2
Ans	C	
2008 P2	<p>1. The vertices of triangle ABC are A(7, 9), B(-3, -1) and C(5, -5) as shown in the diagram.</p> <p>The broken line represents the perpendicular bisector of BC.</p> <p>(a) Show that the equation of the perpendicular bisector of BC is <math>y = 2x - 5</math>.</p> <p>(b) Find the equation of the median from C.</p> <p>(c) Find the coordinates of the point of intersection of the perpendicular bisector of BC and the median from C.</p> 	4 3 3
Ans	(a) Proof      (b) $y = -3x + 10$ (c) (3, 1)	
2007 P1	<p>1. Find the equation of the line through the point (-1, 4) which is parallel to the line with equation <math>3x - y + 2 = 0</math>.</p>	3

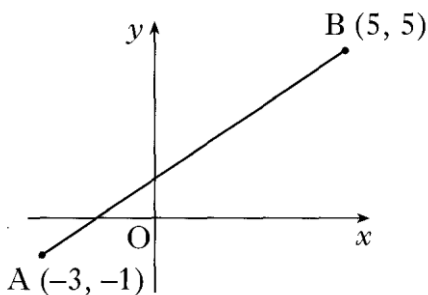
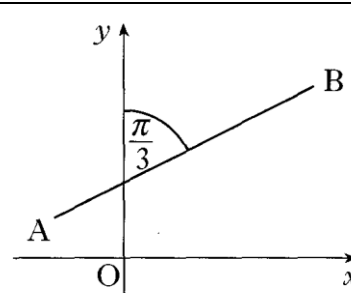
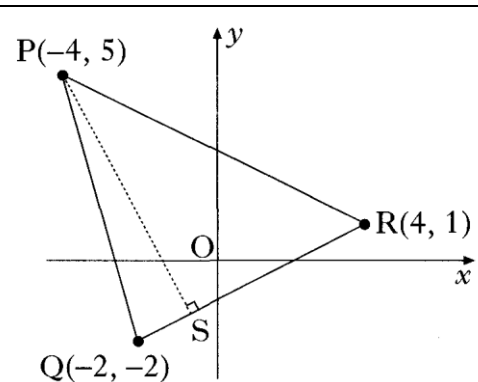
Ans	$y = 3x + 7$	
2006 P1	<p>1. Triangle ABC has vertices A(-1, 12), B(-2, -5) and C(7, -2).</p> <p>(a) Find the equation of the median BD.</p> <p>(b) Find the equation of the altitude AE.</p> <p>(c) Find the coordinates of the point of intersection of BD and AE.</p>	
Ans	<p>(a) <math>y - 5 = 2(x - 3)</math> or <math>y + 5 = 2(x - (-2))</math> etc</p> <p>(b) <math>y - 12 = -3(x - (-1))</math></p> <p>(c) (2, 3)</p>	
2006 P2	<p>1. PQRS is a parallelogram. P is the point (2, 0), S is (4, 6) and Q lies on the x-axis, as shown.</p> <p>The diagonal QS is perpendicular to the side PS.</p>	
	<p>(a) Show that the equation of QS is <math>x + 3y = 22</math>.</p> <p>(b) Hence find the coordinates of Q and R.</p>	4 2
Ans	<p>(a) proof  <math>m_{PS} = 3</math>  <math>m_{QS} = -\frac{1}{3}</math>  <math>y - 6 = -\frac{1}{3}(x - 4)</math> </p> <p>(b) Q = (22, 0)  R = (24, 6)</p>	

2005 P1	<p>1. Find the equation of the line ST, where T is the point <math>(-2, 0)</math> and angle STO is <math>60^\circ</math>.</p> 	3
Ans	$y - 0 = \sqrt{3}(x - (-2))$	
2004 P1	<p>1. The point A has coordinates <math>(7, 4)</math>. The straight lines with equations <math>x + 3y + 1 = 0</math> and <math>2x + 5y = 0</math> intersect at B.</p> <p>(a) Find the gradient of AB.</p> <p>(b) Hence show that AB is perpendicular to only one of these two lines.</p>	3 5
Ans	<p>(a) <math>m_{AB} = 3</math></p> <p>(b) <math>m_{AB} = 3 \Rightarrow m_{\text{perp}} = -\frac{1}{3}</math></p> $y = -\frac{1}{3}x - \frac{1}{3}$ $m_{l_1} = -\frac{1}{3}$ $m_{l_2} = -\frac{2}{5}$ <p>so only the 1st line is perpendicular to AB.</p>	
2004 P2	<p>1. (a) The diagram shows line OA with equation <math>x - 2y = 0</math>. The angle between OA and the <math>x</math>-axis is <math>a^\circ</math>. Find the value of <math>a</math>.</p>  <p>(b) The second diagram shows lines OA and OB. The angle between these two lines is <math>30^\circ</math>. Calculate the gradient of line OB correct to 1 decimal place.</p> 	3 1
Ans	<p>(a) <math>a = 26.6^\circ</math></p> <p>(b) 1.5</p>	

2003 P1	1. Find the equation of the line which passes through the point $(-1, 3)$ and is perpendicular to the line with equation $4x + y - 1 = 0$ .	3
Ans	$x - 4y + 13 = 0$	
2002W P1	1. (a) Find the equation of the straight line through the points $A(-1, 5)$ and $B(3, 1)$ . (b) Find the size of the angle which $AB$ makes with the positive direction of the $x$ -axis.	2 2
Ans	(a) $y + x = 4$ (b) $135^\circ$	
2002W P2	1. The diagram shows a rhombus PQRS with its diagonals PR and QS. PR has equation $y = 2x - 2$ . Q has coordinates $(-2, 4)$ . (a) (i) Find the equation of the diagonal QS. (ii) Find the coordinates of T, the point of intersection of PR and QS. (b) R is the point $(5, 8)$ . Write down the coordinates of P.	 6 2
Ans	(a) $2y + x = 6$ , $T(2, 2)$ (b) $P(-1, -4)$	
2002 P2	1. Triangle ABC has vertices $A(-1, 6)$ , $B(-3, -2)$ and $C(5, 2)$ . Find (a) the equation of the line $p$ , the median from C of triangle ABC. (b) the equation of the line $q$ , the perpendicular bisector of BC. (c) the coordinates of the point of intersection of the lines $p$ and $q$ .	 3 4 1
Ans	(a) $y = 2$ (b) $y = -2x + 2$ (c) $(0, 2)$	



2001 P1	1. Find the equation of the straight line which is parallel to the line with equation $2x + 3y = 5$ and which passes through the point $(2, -1)$ .	3
Ans	$2x + 3y = 1$	
2001 P2	<p>7. Triangle ABC has vertices A(2, 2), B(12, 2) and C(8, 6).</p> <p>(a) Write down the equation of <math>l_1</math>, the perpendicular bisector of AB.</p> <p>(b) Find the equation of <math>l_2</math>, the perpendicular bisector of AC.</p> <p>(c) Find the point of intersection of lines <math>l_1</math> and <math>l_2</math>.</p> <p>(d) Hence find the equation of the circle passing through A, B and C.</p>	 <p>1 4 1 2</p>
Ans	<p>(a) <math>x = 7</math></p> <p>(b) <math>3x + 2y = 23</math></p> <p>(c) <math>(7, 1)</math></p> <p>(d) <math>(x - 7)^2 + (y - 1)^2 = 26</math></p>	
2000 P1	3. Find the size of the angle $a^\circ$ that the line joining the points A(0, -1) and B( $3\sqrt{3}$ , 2) makes with the positive direction of the x-axis.	3
Ans	30 degrees	
2000 P2	<p>2. (a) Find the equation of AB, the perpendicular bisector of the line joining the points P(-3, 1) and Q(1, 9).</p>	 <p>4</p>

Ans	(a) $x + 2y = 9$		
Specimen 2 P1	<p>2. A and B are the points <math>(-3, -1)</math> and <math>(5, 5)</math>. Find the equation of the perpendicular bisector of AB.</p>		4
Ans	$m_{AB} = \frac{3}{4} \Rightarrow m_{\text{perp}} = -\frac{4}{3}$ midpoint = $(1, 2)$ $y - 2 = -\frac{4}{3}(x - 1)$		
Specimen 2 P1	<p>4. The line AB makes an angle of <math>\frac{\pi}{3}</math> radians with the y-axis, as shown in the diagram. Find the exact value of the gradient of AB.</p>		2
Ans	angle between line and x-axis = $\frac{\pi}{2} - \frac{\pi}{3}$ gradient = $\tan \frac{\pi}{6} = \frac{1}{\sqrt{3}}$		
Specimen 1 P1	<p>1. <math>P(-4, 5)</math>, <math>Q(-2, -2)</math> and <math>R(4, 1)</math> are the vertices of triangle PQR as shown in the diagram. Find the equation of PS, the altitude from P.</p>		3
Ans	$y = -2x - 3$		
Specimen 1 P2	<p>1. ABCD is a parallelogram. A, B and C have coordinates <math>(2, 3)</math>, <math>(4, 7)</math> and <math>(8, 11)</math>. Find the equation of DC.</p>		3
Ans	$y = 2x - 5$		