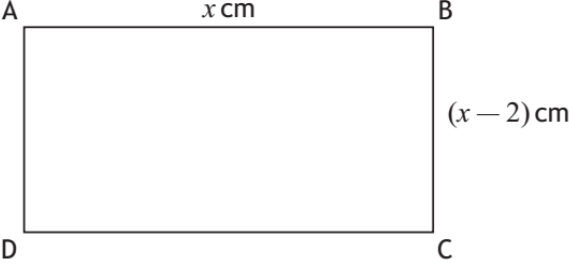


Y	Q	P	Quadratics
15	8	1	<p>ABCD is a rectangle with sides of lengths <math>x</math> centimetres and <math>(x - 2)</math> centimetres, as shown.</p> <div style="text-align: center;">  </div> <p>If the area of ABCD is less than <math>15 \text{ cm}^2</math>, determine the range of possible values of <math>x</math>.</p> <p style="text-align: right;"><b>4</b></p>
16	12	1	<p>The functions <math>f</math> and <math>g</math> are defined on <math>\mathbb{R}</math>, the set of real numbers by  <math>f(x) = 2x^2 - 4x + 5</math> and <math>g(x) = 3 - x</math>.</p> <p>(a) Given <math>h(x) = f(g(x))</math>, show that <math>h(x) = 2x^2 - 8x + 11</math>. <span style="float: right;"><b>2</b></span></p> <p>(b) Express <math>h(x)</math> in the form <math>p(x+q)^2 + r</math>. <span style="float: right;"><b>3</b></span></p>
16	2	2	<p>Find the range of values for <math>p</math> such that <math>x^2 - 2x + 3 - p = 0</math> has no real roots. <span style="float: right;"><b>3</b></span></p>
17	4	1	<p>Find the value of <math>k</math> for which the equation <math>x^2 + 4x + (k - 5) = 0</math> has equal roots. <span style="float: right;"><b>3</b></span></p>
18	4	2	<p>Express <math>-3x^2 - 6x + 7</math> in the form <math>a(x+b)^2 + c</math>. <span style="float: right;"><b>3</b></span></p>
19	7	2	<p>(a) Express <math>-6x^2 + 24x - 25</math> in the form <math>p(x+q)^2 + r</math>. <span style="float: right;"><b>3</b></span></p> <p>(b) Given that <math>f(x) = -2x^3 + 12x^2 - 25x + 9</math>,  show that <math>f(x)</math> is strictly decreasing for all <math>x \in \mathbb{R}</math>. <span style="float: right;"><b>3</b></span></p>
22	11	1	<p>Express <math>2x^2 + 12x + 23</math> in the form <math>p(x+q)^2 + r</math>. <span style="float: right;"><b>3</b></span></p>
22	2	2	<p>The equation <math>2x^2 - 8x + (4 - p) = 0</math> has two real and distinct roots.</p> <p>Determine the range of values for <math>p</math>. <span style="float: right;"><b>3</b></span></p>