

Question	Scheme	Marks
<b>1</b>	$\sqrt{50}x - \sqrt{18} > 6x + 5 \Rightarrow \sqrt{50}x - 6x > 5 + \sqrt{18} \Rightarrow x > \frac{5 + \sqrt{18}}{\sqrt{50} - 6}$ $\frac{5 + \sqrt{18}}{\sqrt{50} - 6} \times \frac{\sqrt{50} + 6}{\sqrt{50} + 6} = \frac{5\sqrt{50} + 30 + \sqrt{18}\sqrt{50} + 6\sqrt{18}}{14} = \frac{43\sqrt{2} + 60}{14}$ $x > \frac{43\sqrt{2} + 60}{14}$	<p>M1</p> <p>M1dM1</p> <p>A1</p> <p>[4]</p>
<b>Total 4 marks</b>		

Mark	Notes
M1	<p>Collects like terms and obtains a value for <math>x</math> in the minimally acceptable form:</p> $x > \frac{a + \sqrt{18}}{\sqrt{50} - 6} \quad \text{o.e for example } x > \frac{a + 3\sqrt{2}}{5\sqrt{2} - 6} \text{ where } a \text{ is an integer.}$ <p>Please watch out for reversed signs For example, accept <math>\frac{-a - \sqrt{18}}{-\sqrt{50} + 6}</math></p> <p>Ignore the inequality and accept <math>&gt;, &lt;, =</math> for this mark</p>
M1	<p>For showing the intent to multiply the numerator and denominator by the conjugate of <b>their</b> <math>(\sqrt{50} + 6 \text{ or } 5\sqrt{2} + 6)</math> but minimally of the form <math>\sqrt{A} + B</math> or <math>C\sqrt{2} + D</math></p> <p>e.g., <math>\frac{5 + \sqrt{18}}{\sqrt{50} - 6} \times \frac{\sqrt{50} + 6}{\sqrt{50} + 6}</math> scores this mark.</p> <p>That is all that is required for this mark.</p> <p>Ignore <math>&gt;, &lt;, =</math> for this mark</p>
dM1	<p>For explicitly multiplying out and simplifying their expression to obtain a value for <math>x</math> in the required form. Allow no more than one error in this simplification.</p> <p>However, it must be simplified as far as <math>\frac{A + \sqrt{B}}{C}</math> or <math>\frac{P + Q\sqrt{R}}{T}</math> where <math>A, B, C, P, Q, R</math> and <math>T</math> are integers</p> <p>Ignore <math>&gt;, &lt;, =</math> for this mark</p>
A1	<p>For obtaining the value of <math>x</math> as given with the correct inequality.</p> <p>For candidates who give an estimated value [8.629....] , please isw if you see the exact value first.</p>

<b>ALT 1 – Squares both sides [Ignore &lt;, &gt;, = for the first 3 marks]</b>	
M1	Squares both sides without errors. $(\sqrt{50}x - \sqrt{18})^2 > (6x + 5)^2 \Rightarrow 50x^2 - 60x + 18 > 36x^2 + 60x + 25$
M1	Collects up their like terms and forms a 3TQ $\Rightarrow 14x^2 - 120x - 7 > 0$
dM1	Solves their 3TQ by either valid method using the formula or completing the square. $x = \frac{60 \pm 43\sqrt{2}}{14} \quad \text{oe} \quad \text{eg., } x = \frac{60 \pm \sqrt{3698}}{14} \quad \text{Accept } \pm \text{ for this mark}$ We MUST see a method for the award of this mark. Do not award for roots appearing with no working.  Ignore >, <, = for this mark
A1	For obtaining the value of $x$ as given with the correct inequality. This has to be $x > \frac{43\sqrt{2} + 60}{14}$  For candidates who give an estimated value [8.629....] , please isw if you see the exact value first.
<b>ALT 2 – Collects up like terms and squares [Ignore &lt;, &gt;, = for the first 3 marks]</b>	
M1	Squares both sides without error. $(\sqrt{50}x - 6x)^2 > (5 + \sqrt{18})^2 \Rightarrow 50x^2 - 12\sqrt{50}x^2 + 36x^2 > 25 + 10\sqrt{18} + 18$
M1	Collects up like terms and forms a 2TQ $86x^2 - 12\sqrt{50}x^2 - (43 + 10\sqrt{18}) > 0 \Rightarrow [(86 - 60\sqrt{2})x^2 - (43 + 30\sqrt{18}) > 0]$
dM1	Solves their 2TQ by either valid method using the formula or completing the square. $x = \frac{43\sqrt{2} \pm 60}{14} \quad \text{oe} \quad \text{eg., } x = \frac{\sqrt{3698} \pm 60}{14}$ We MUST see a method for the award of this mark. Do not award for roots appearing with no working.
A1	For obtaining the value of $x$ as given with the correct inequality. This has to be $x > \frac{43\sqrt{2} + 60}{14}$  For candidates who give an estimated value [8.629....] , please isw if you see the exact value first.