Question	Scheme	Marks	AOs
11 (a) Way 1	Since x and y are positive, their square roots are real and so $(\sqrt{x}-\sqrt{y})^2 \geq 0$ giving $x - 2\sqrt{x}\sqrt{y} + y \geq 0$	M1	2.1
	$\therefore\ 2\sqrt{xy} \leq x + y$ provided x and y are positive and so $\sqrt{xy} \leq \frac{x+y}{2}$ *	A1*	2.2a
		(2)	
Way 2 Longer method	Since $(x-y)^2 \geq 0$ for real values of x and y, $x^2 - 2xy + y^2 \geq 0$ and so $4xy \leq x^2 + 2xy + y^2$ i.e. $4xy \leq (x+y)^2$	M1	2.1
	$\therefore\ 2\sqrt{xy} \leq x + y$ provided x and y are positive and so $\sqrt{xy} \leq \frac{x+y}{2}$ *	A1*	2.2a
		(2)	
(b)	Let $x = -3$ and $y = -5$ then LHS $= \sqrt{15}$ and RHS$= -4$ so as $\sqrt{15} > -4$ result does not apply	B1	2.4
		(1)	
			(3 marks)

Notes:

(a)

M1: Need two stages of the three stage argument involving the three stages, squaring, square rooting terms and rearranging

A1*: Need all three stages making the correct deduction to achieve the printed result

(b)

B1: Chooses two negative values and substitutes, then states conclusion