

(1) أنشر وأبسط:

$$\begin{aligned}(2\sqrt{3} + \sqrt{11})^2 &= (2\sqrt{3})^2 + 2 \times 2\sqrt{3} \times \sqrt{11} + \sqrt{11}^2 \\ &= 12 + 4\sqrt{33} + 11\end{aligned}$$

$$\boxed{(2\sqrt{3} + \sqrt{11})^2 = 23 + 4\sqrt{33}}$$

(2) اجعل جذريا مقام العدد التالي:

$$\begin{aligned}\frac{1}{2\sqrt{3} - \sqrt{11}} &= \frac{(2\sqrt{3} + \sqrt{11})}{(2\sqrt{3} - \sqrt{11})(2\sqrt{3} + \sqrt{11})} \\ &= \frac{2\sqrt{3} + \sqrt{11}}{(2\sqrt{3})^2 - (\sqrt{11})^2} \\ &= \frac{2\sqrt{3} + \sqrt{11}}{12 - 11} \\ &= \frac{2\sqrt{3} + \sqrt{11}}{1}\end{aligned}$$

$$\boxed{\frac{1}{2\sqrt{3} - \sqrt{11}} = 2\sqrt{3} + \sqrt{11}}$$

(3) ابسط التعبيرين :

$$x = \sqrt{23 + 4\sqrt{33}} - \frac{1}{2\sqrt{3} - 11}$$

$$x = \sqrt{(2\sqrt{3} + \sqrt{11})^2} - (2\sqrt{3} + \sqrt{11})$$

$$= \cancel{2\sqrt{3}} + \sqrt{11} - \cancel{2\sqrt{3}} - \sqrt{11}$$

$$\boxed{x = 0}$$

$$y = \frac{\sqrt{8 + \sqrt{60}}}{2} + \frac{1}{\sqrt{3} + \sqrt{5}}$$

$$= \frac{\sqrt{8 + 2\sqrt{15}}}{2} + \frac{(\sqrt{3} - \sqrt{5})}{(\sqrt{3} + \sqrt{5})(\sqrt{3} - \sqrt{5})}$$

$$= \frac{\sqrt{\sqrt{3}^2 + 2\sqrt{3} \times \sqrt{5} + \sqrt{5}^2}}{2} + \frac{\sqrt{3} - \sqrt{5}}{-2}$$

$$= \frac{\sqrt{(\sqrt{3} + \sqrt{5})^2} - \sqrt{3} + \sqrt{5}}{2}$$

$$= \frac{\cancel{\sqrt{3}} + \sqrt{5} - \cancel{\sqrt{3}} + \sqrt{5}}{2}$$

$$= \frac{\cancel{2}\sqrt{5}}{\cancel{2}}$$

$$\boxed{y = \sqrt{5}}$$