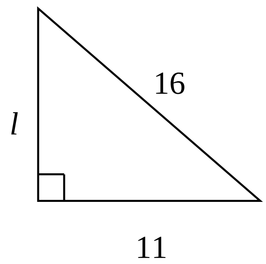
| Question number | Scheme | Marks |
|---|---|---|
| 2 (a) | $\cos ABC = \dfrac{(2x)^2+(4x)^2-(3x)^2}{2\times 2x\times 4x} = \dfrac{x^2(4+16-9)}{x^2(16)} = \dfrac{11}{16}$ | M1A1 |
| |  $l = \sqrt{16^2-11^2} = 3\sqrt{15}$ | M1 |
| | $\sin ABC = \dfrac{3\sqrt{15}}{16}$ * | A1<br>[4] |
| | **ALT**<br>$\sin^2 ABC = 1- \dfrac{121}{256} = \dfrac{135}{256}$ Þ $\sin ABC = \dfrac{3\sqrt{15}}{16}$* | {M1A1} |
| (b) | $\dfrac{75\sqrt{15}}{64} = \dfrac{1}{2}\times 2x\times 4x\times \dfrac{3\sqrt{15}}{16} \Rightarrow x^2 = \dfrac{25}{16} \Rightarrow x = \dfrac{5}{4}$ oe<br>(positive root only) | M1A1<br>[2] |
| | | Total 6 marks |
| (a) | | |
| M1 | Use the cosine rule, either form. If not for angle *ABC* there must be a complete method shown for obtaining *ABC* | |
| A1 | Correct expression for $\cos ABC$ | |
| M1 | Use of Pythagoras' leading to $l = \ldots$ | |
| A1 | Obtains the **given** expression for $\sin ABC$ | |
| ALT: | | |
| M1 | Use of $\sin^2\theta + \cos^2\theta = 1$ leading to $\sin^2\theta = \ldots$ | |
| A1 | Obtains the **given** expression for $\sin ABC$ | |
| (b) | | |
| M1 | Use of $\dfrac{1}{2}ab\sin C = \dfrac{75\sqrt{15}}{64}$ Need not be simplified. | |
| A1 | $x = \dfrac{5}{4}$ oe | |