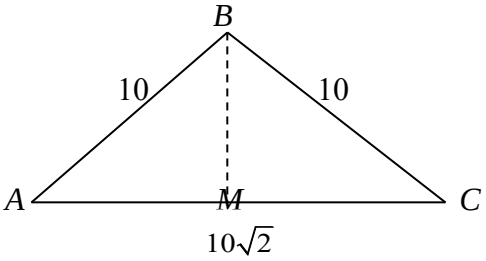
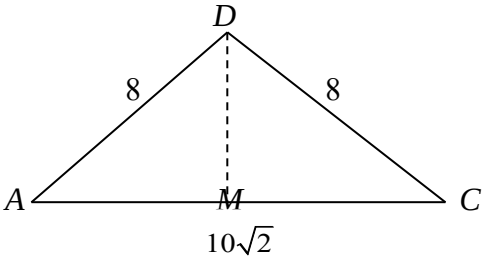
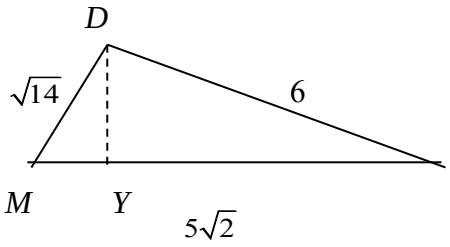
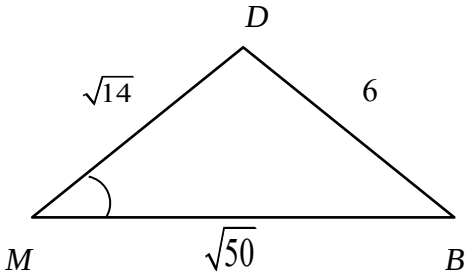
| Question number | Scheme | Marks |
|---|---|---|
| 9 (a) | $AC = \sqrt{10^2 + 10^2} = \sqrt{200} = 10\sqrt{2}$ | M1A1 [2] |
| (b) |  <br>$BM = \sqrt{10^2 - \left(5\sqrt{2}\right)^2} = 5\sqrt{2}$ | M1A1 [2] |
| (c) |  <br>$DM = \sqrt{8^2 - \left(5\sqrt{2}\right)^2} = \sqrt{14}$<br><br>$\angle DMB = \cos^{-1}\left(\frac{14 + 50 - 36}{2 \times \sqrt{14} \times 5\sqrt{2}}\right) = 58.0519...^{\circ} \approx 58.1^{\circ}$ | M1A1<br><br>M1A1 [4] |
| (d) | Let perpendicular from point $D$ to $BM$ be the point $Y$<br>  <br>Vertical height of shape $ABCD$<br><br>In triangle $DMY$ (above)<br>$\text{Height} = DY = \sqrt{14}\sin 58.0519^{\circ} = 3.1749... \approx 3.17 \text{ (cm)}$ | M1A1 [2] |
| | | **Total 10 marks** |

| Part | Mark | Notes |
|---|---|---|
| **(a)** | **M1** | For using Pythagoras theorem correctly on triangle *ABC* to find *AC* |
| | **A1** | For $AC = 10\sqrt{2}$ |
| **(b)** | **M1** | For using Pythagoras theorem or any appropriate trigonometry correctly on triangle *ABC* to find *BM* |
| | **A1** | For the correct length $BM = 5\sqrt{2}$<br>**NB:** Allow for the answer just seen without any working as the triangle *ABC* is isosceles. |
| **(c)** | **M1** | For using Pythagoras theorem to find the length *DM* |
| | **A1** | For $DM = \sqrt{14}$ or accept awrt 3.74 |
| | **M1** | For using cosine rule to find the required angle *DMB*<br>  |
| | **A1** | For awrt 58.1° |
| **(d)** | **M1** | For using any appropriate trigonometry to find the required length.<br>Ft their angle *DMB* |
| | **A1** | For awrt 3.17 (cm)<br>Accept 3.18 (cm) |