6.

Figure 2

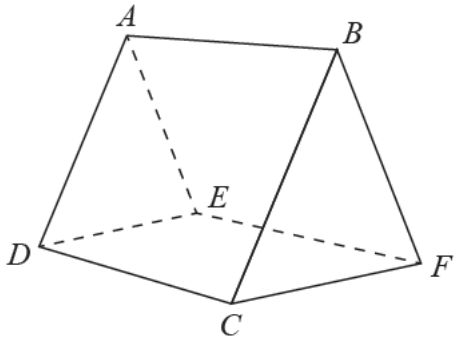

Figure 3

A tent is shown in Figure 2.
The tent is modelled as a triangular prism *ABCDEF* shown in Figure 3.

The side *ABCD* is modelled by part of the plane with Cartesian equation

$$2x + 3y - 4z = 1$$

The side *ABFE* is modelled by part of the plane with Cartesian equation

$$8x + 12y + 15z = 252$$

(a) Find, according to the model, the acute angle between these two sides of the tent. Give your answer to the nearest degree.

(3)

These two sides of the tent meet along the straight line *AB*.

(b) Show, according to the model, that the point *P* (6, 7, 8) lies on this straight line.

(2)

One end of a rope is attached to the top of the tent at the point *P*. The other end is pegged into the ground at the point *Q*. The rope is modelled as a straight line and, according to the model, *Q* has coordinates (–4, –3, 0)

(c) Find, according to the model, the acute angle between the rope *PQ* and the side *ABCD* of the tent. Give your answer to the nearest degree.

(5)