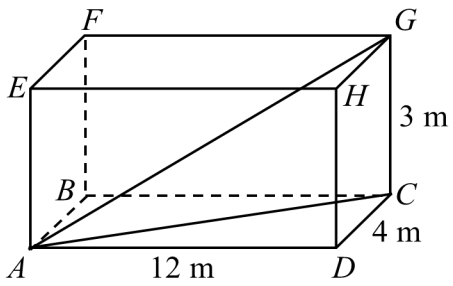
Applications of Trigonometry
Simple Three-Dimensional Problems I

Question 1



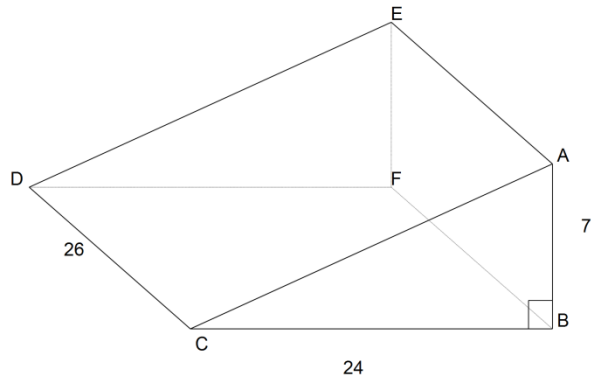
A room is 12 m long, 4 m wide and 3 m high as shown in the figure below.

(a) Find the length AC, the diagonal of the rectangular floor.

(b) Hence, find the length of AG, the line from A, a corner of the floor to G, the opposite corner of the ceiling.

(a) 12.6 m (3 sf) (b) 13 m

Question 2



The diagram shows a triangular prism with $\angle ABC = 90°$. $AB = 7$ cm, $BC = 24$ cm and $CD = 26$ cm. Calculate

(a) EB,

(b) EC,

(c) $\angle CEB$.

(a) 26.9 m (3 sf) (b) 36.1 m (3 sf)
(c) 41.7° (1 dp)

Question 3

In the diagram, *ABEF* represents the rectangular sloping surface of a ramp. *ABCD*, a square is on level ground. *CE* and *DF* are vertical lines, $\angle FAD = 28°$ and $AF = 100$ m. Point *X* is on *FE* such that $FE = 4XE$. Calculate

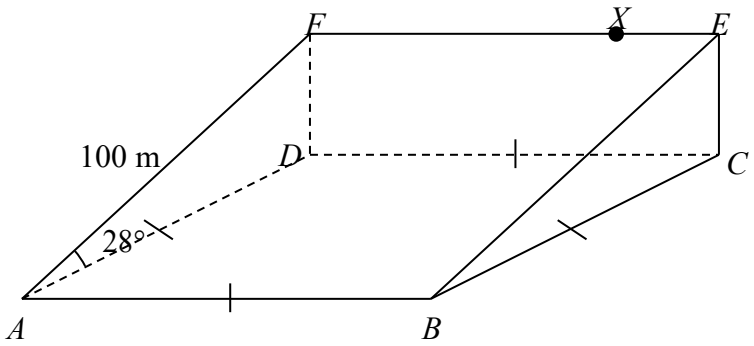
(a) *FD*,

(b) *BC*,

(c) *AC*,

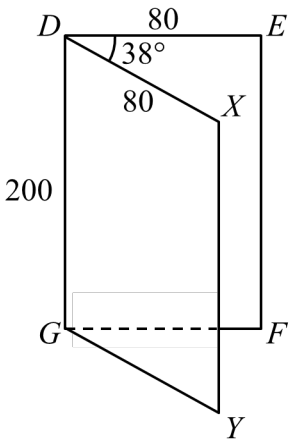
(d) $\angle EAC$,

(e) $\angle EXB$.



(a) 46.9 m (3 sf) (b) 88.3 m (3 sf) (c) 125 m (3 sf)
(d) 20.6° (1 dp) (e) 77.6° (1 dp)

Question 4



In the diagram, *DEFG* represents a rectangle door frame. *DXYG* represents a rectangular door which can turn about DG and fits into the door frame. The door is opened through 38°, as shown. $DE = DX = 80$ cm and $DG = 200$ cm. Calculate

(a) the length of the straight line *EX*,

(b) angle *FDY*.

(a) 52.1 cm (3 sf) (b) 13.9° (1 dp)