3D Trigonometry



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The diagram shows a triangular prism of length 12 cm. Triangle *ABC* is a cross section of the prism. Angle $BAC = 90^\circ$, AC = 6 cm and AB = 5 cm.

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Calculate the angle between the line *CE* and the base *ABED*.

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A cuboid has length 45 cm, width 22 cm and height 12 cm.

Calculate the length of the straight line *XY*.

Answer(b) XY = cm [4]

(b)



ABCDEFGH is a cuboid. AB = 4 cm, BC = 3 cm and AG = 12 cm.

Calculate the angle that AG makes with the base ABCD.



The diagram shows a cuboid. HD = 3 cm, EH = 5 cm and EF = 7 cm.

Calculate

(a) the length *CE*,

CE = cm [4]

(b) the angle between *CE* and the base *CDHG*.

.....[3]

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The diagram shows a cube of side length 8 cm.

(a) Calculate the length of the diagonal BS.

BS = cm [3]

(b) Calculate angle *SBD*.

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The diagram shows a pyramid with a square base *ABCD* of side 6 cm.

The height of the pyramid, PM, is 4 cm, where M is the centre of the base.

Calculate the total surface area of the pyramid.

Answer cm^2 [5]





(b) The diagram shows a pyramid with a horizontal rectangular base.



The rectangular base has length 4.8 m and width 3 m and the height of the pyramid is 4 m.

Calculate

(i) *y*, the length of a sloping edge of the pyramid,

Answer(b)(i) *y* = m [4]

(ii) the angle between a sloping edge and the rectangular base of the pyramid.



The diagram shows a pyramid on a square base ABCD with diagonals, AC and BD, of length 8 cm. AC and BD meet at M and the vertex, P, of the pyramid is vertically above M. The sloping edges of the pyramid are of length 6 cm.

Calculate

(a) the perpendicular height, *PM*, of the pyramid,

Answer(a) $PM = \dots$ cm [3]

(b) the angle between a sloping edge and the base of the pyramid.

Question 22 is printed on the next page.



The diagram shows a solid pyramid on a square horizontal base *ABCD*. The diagonals *AC* and *BD* intersect at *M*. *P* is vertically above *M*. AB = 20 cm and PM = 8 cm.

Calculate the total surface area of the pyramid.