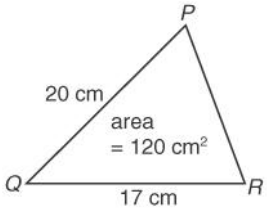
More about Trigonometry (II)

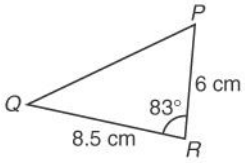
續三角 (二)

Exercises(練習)

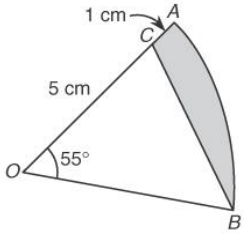
1. The area of $\triangle PQR$ is 120 cm^2. If PQ = 20 cm and QR = 17 cm, find the possible values of Q correct to 1 decimal place.
在圖中，$\triangle PQR$ 的面積是 120 cm^2。若 PQ = 20 cm 及 QR = 17 cm，求 Q 的可能值，準確至一位小數。



2. Find the area of $\triangle$PQR correct to 1 decimal place.
求 $\triangle PQR$ 的面積，準確至一位小數。

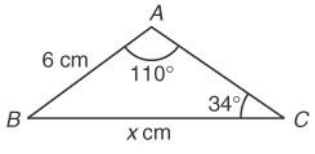


3. The figure shows a sector OAB with centre O. If OC = 5 cm , CA = 1 cm and $\angle AOB$ = 55°, find the area of the shaded region correct to 3 significant figures.
圖中所示為一個以 O 為圓心的扇形 OAB。若 OC = 5 cm，CA = 1 cm 及 $\angle AOB$ = 55°，求陰影區域的面積，準確至三位有效數字。

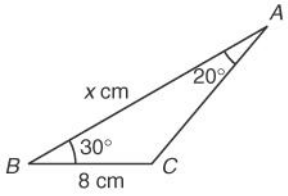


4. Find the values of x in the following triangles.
(Give your answers correct to 3 significant figures.)
求下列各三角形中 x 的值，準確至三位有效數字。

(a)



(b)



5. Find the values of B in $\triangle ABC$ for the following conditions.

(Give your answers correct to 3 significant figures if necessary.)

求下列各 $\triangle ABC$ 中 B 的值。

(如有需要，取答案準確至三位有效數字。)

(a) $A = 138°$, $a = 4$ cm, $b = 7$ cm

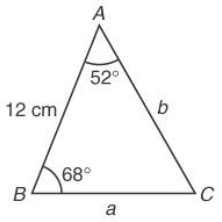
(b) $A = 138°$, $a = 9$ cm, $b = 7$ cm

6. Solve the triangle as shown in the figure.

(Give your answers correct to 3 significant figures if necessary.)

解圖中的三角形。

(如有需要，取答案準確至三位有效數字。)



7. Find the values of B in $\triangle ABC$ for the following conditions.

(Give your answers correct to 3 significant figures if necessary.)

求下列各 $\triangle ABC$ 中 B 的值。

(如有需要，取答案準確至三位有效數字。)

(a) $A = 45°$, $a = 6$ cm, $b = 10$ cm

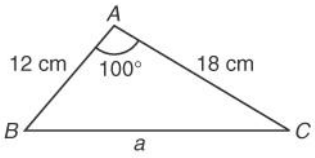
(b) $A = 45°$, $a = 5\sqrt{2}$ cm, $b = 10$ cm

(c) $A = 45°$, $a = 8$ cm, $b = 10$ cm

(d) $A = 45°$, $a = 12$ cm, $b = 10$ cm

8. In $\triangle$ABC, b = 18 cm, c = 12 cm and A = 100°. Find a correct to 3 significant figures.

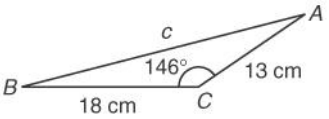
在 $\triangle ABC$ 中，$b = 18$ cm，$c = 12$ cm 及 $A = 100°$。求 a 的值，準確至三位有效數字。



9. In $\triangle ABC$, $a = 18$ cm, $b = 13$ cm and $C = 146°$. Solve the triangle.

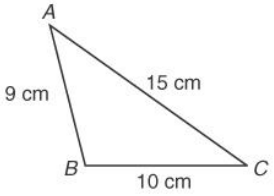
(Give your answers correct to 1 decimal place.)

在 $\triangle ABC$ 中，$a = 18$ cm，$b = 13$ cm 及 $C = 146°$。解 $\triangle ABC$，答案須準確至一位小數。



10. In $\triangle$ABC, a = 10 cm, b = 15 cm and c = 9 cm. Find A correct to the nearest degree.

在 $\triangle ABC$ 中，$a = 10$ cm，$b = 15$ cm 及 $c = 9$ cm。求 A 的值，準確至最接近的度。

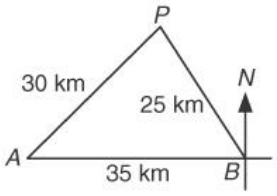


11. In $\triangle ABC$, $a = 72$ cm, $b = 59$ cm and $c = 86$ cm. Solve the triangle.

(Give your answers correct to 1 decimal place.)

在 $\triangle ABC$ 中，$a = 72$ cm，$b = 59$ cm 及 $c = 86$ cm。解 $\triangle ABC$，答案須準確至一位小數。

12. In the figure, *B* is 35 km due east of *A*. *P* is a point on the north side of *AB* such that *AP* = 30 km and *PB* = 25 km. Find the true bearing of



(a) *P* from *A*,

(b) *P* from *B*.

(Give your answers correct to the nearest degree.)

在圖中，*B* 位於 *A* 的正東面 35 km 處，而 *P* 則位於 *AB* 的北面，且 *AP* = 30 km 及 *PB* = 25 km。求

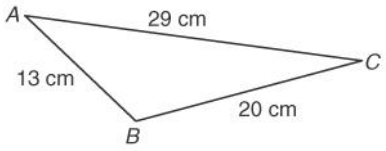
(a) 由 *A* 測得 *P* 的真方位角；

(b) 由 *B* 測得 *P* 的真方位角。

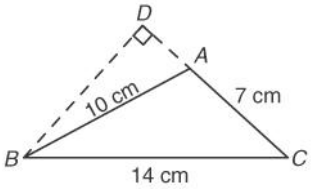
(答案須準確至最接近的度。)

13. Find the area of $\triangle ABC$ correct to 3 significant figures.

*求 △***ABC** *的面積，準確至三位有效數字。*



14. In the figure, $\triangle ABC$ is a triangle with sides 10 cm, 14 cm and 7 cm. Find



(a) the area of $\triangle ABC$,

(b) the altitude *BD*.

(Give your answers correct to 1 decimal place.)

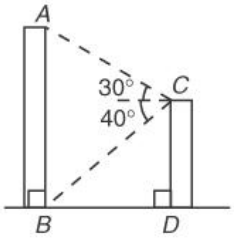
在圖中，$\triangle ABC$ 的邊長分別是 10 cm、14 cm 及 7 cm。求

(a) $\triangle ABC$ 的面積；

(b) 高 *BD*。

(答案須準確至一位小數。)

15. The angle of elevation of the top *A* and the angle of depression of the bottom *B* of a building *AB* from the top *C* of another building *CD* are 30° and 40° respectively. If the height of *AB* is 50 m, find the height of *CD* correct to the nearest m.



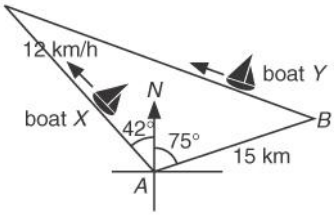
如圖所示，從一座大廈 *CD* 的最高點 *C*，測得另一座大廈 *AB* 的最高點 *A* 的仰角為 30°，並測得最低點 *B* 的俯角為 40°。若大廈 *AB* 高 50 m，求大廈 *CD* 的高度，準確至最接近的 m。

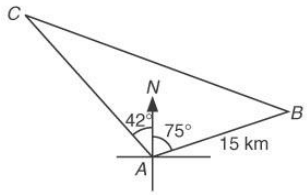
16. In the figure, boat* X *leaves a port* A *and sails N42°W at 12 km/h. At the same time, boat* Y *leaves another port* B *where the bearing of* B *from* A *is N75°E and* AB *= 15 km. In order to meet boat* X *in 100 minutes, find the course and speed of boat* Y *correct to 3 significant figures.

在圖中，船 *X* 離開港口 *A*，並以 12 km/h 的速率沿 N42°W 的方向航行。與此同時，船 *Y* 則離開港口 *B*。已知 *AB* = 15 km，及由 *A* 測得 *B* 的方位角是 N75°E。若船 *Y* 須在 100 分鐘內與船 *X* 會合，求船 *Y* 的航行方向和速率。

(答案須準確至三位有效數字。)

Let *C* be the point where boat *Y* meets boat *X* in 100 minutes.

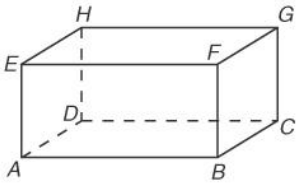




17. The figure shows a rectangular block. Name the angles between

(a) line *AG* and plane *BFGC*,

(b) planes *BEC* and *BFGC*.



根據圖中的長方體，寫出下列各交角的名稱。

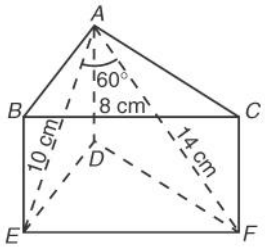
(a) 直線 *AG* 與平面 *BFGC* 的交角。

(b) 平面 *BEC* 與 *BFGC* 的交角。

18. The figure shows a right triangular prism *ABCFDE*, where *AE* = 10 cm, *AD* = 8 cm, *AF* = 14 cm and $\angle EAF = 60°$.

(a) Find *EF* and leave your answer in surd form.

(b) ***Find the angle between the planes* ABED *and* ACFD*, correct to the nearest degree.***



圖中所示為直立三棱柱 *ABCFDE*，其中 *AE* = 10 cm，*AD* = 8 cm，*AF* = 14 cm 及 $\angle EAF = 60°$。

(a) 求 *EF* 的長度，答案以根式表示。

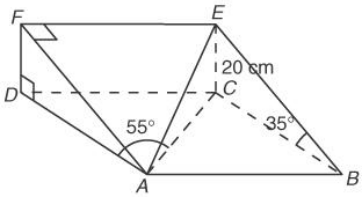
(b) 求平面 *ABED* 與 *ACFD* 的交角，準確至最接近的度。

19. The figure shows a triangular prism where *ABCD*, *CEFD* and *ABEF* are rectangles. *ABCD* is perpendicular to *CEFD*. If *EC* = 20 cm, ∠*EBC* = 35° and ∠*DAC* = 55°, find

(a) *EA*,

(b) the angle between *EA* and plane *ABCD*.

(Give your answers correct to 3 significant figures.)



圖中所示為一個三棱柱，其中 **ABCD**、**CEFD** *和* **ABEF** *均是長方形，而平面* **ABCD** *與* **CEFD** 互相垂直。若 *EC* = 20 cm，∠*EBC* = 35° 及 ∠*DAC* = 55°，求

(a) *EA* 的長度；

(b) 直線 *EA* 與平面 *ABCD* 的交角。

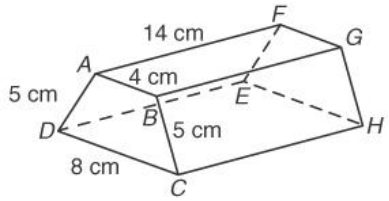
(答案須準確至三位有效數字。)

20. The cross-section of the right prism shown is an isosceles trapezium, *AB* = 4 cm, *CD* = 8 cm, *AD* = *BC* = 5 cm and *AF* = 14 cm. Find the angles between the planes

(a) *ADEF* and *CDEH*,

(b) *FDCG* and *CDEH*.

(Give your answers correct to 3 significant figures.)



圖中所示為一個直立棱柱，其橫切面是一個等腰梯形。已知 *AB* = 4 cm，*CD* = 8 cm，*AD* = *BC* = 5 cm 及 *AF* = 14 cm，求下列各平面之間的交角。

(a) *ADEF* 與 *CDEH*；

(b) *FDCG* 與 *CDEH*。

(答案須準確至三位有效數字。)

21. The figure shows a rectangular block, *AM* = *MB* = 3 cm, *AF* = 8 cm and *FE* = 5 cm.

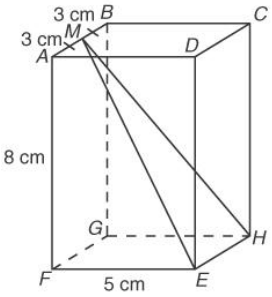
(a) Find *EM* and leave your answer in surd form.

(b) Find the angles between

(i) the planes *MEH* and *GFEH*,

(ii) *ME* and plane *GFEH*.

(Give your answers correct to 3 significant figures.)



圖中所示為一個長方體，其中 *AM* = *MB* = 3 cm，*AF* = 8 cm 及 *FE* = 5 cm。

(a) 求 *EM* 的長度，答案以根式表示。

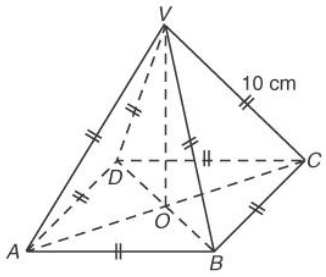
(b) 求

(i) 平面 *MEH* 與 *GFEH* 的交角；

(ii) 直線 *ME* 與平面 *GFEH* 的交角。

(答案須準確至三位有效數字。)

22. In the figure, *VABCD* is a right pyramid with a square base *ABCD*.



VA = *VB* = *VC* = *VD* = *AB* = 10 cm. *O* is the point of intersection of diagonals *AC* and *BD*. Find the angles between

(a) *VA* and plane *ABCD*,

(b) the planes *VAB* and *ABCD*,

(c) *VO* and plane *VBC*.

(Give your answers correct to 1 decimal place if necessary.)

在圖中，*VABCD* 是一個直立棱錐。正方形 *ABCD* 是棱錐的底，其中 *VA* = *VB* = *VC* = *VD* = *AB* = 10 cm，而 *O* 是兩條對角線 *AC* 和 *BD* 的交點。求

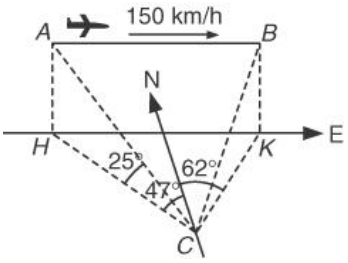
(a) *VA* 與平面 *ABCD* 的交角；

(b) 平面 *VAB* 與 *ABCD* 的交角；

(c) *VO* 與平面 *VBC* 的交角。

(如有需要，取答案準確至一位小數。)

23. An aeroplane flies eastwards at a speed of 150 km/h at a constant height along the path *AB* as shown. At noon, the aeroplane is at *A* and at 12:20 p.m., the aeroplane is at *B*. *H* and *K* are projections of *A* and *B* on the horizontal ground respectively. The angle of elevation of *A* from *C* is 25°. Find



(a) the height of the aeroplane from the ground,

(b) the angle of elevation of *B* from *C*.

(Give your answers correct to 2 decimal places.)

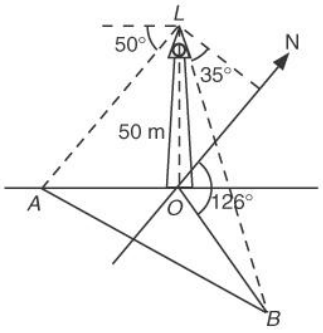
一架飛機以 150 km/h 的速率，並以固定高度沿航線 *AB* 向東飛行。在正午時，飛機正位於 *A*，而由 *C* 測得 *A* 的仰角是 25°；而在下午 12:20，飛機則位於 *B*。已知 *H* 和 *K* 分別是 *A* 和 *B* 在地面上的投影。求

(a) 飛機航行時的固定高度；

(b) 由 *C* 測得 *B* 的仰角。

(答案須準確至二位小數。)

24. From the top *L* of a lighthouse *LO* of height 50 m, a man observes that the angle of depression of boat *A*, due west of *O*, is 50°, while the angle of depression of another boat *B*, with true bearing 126° from *O*, is 35°. Find



(a) the distance between *A* and *B*,

(b) the true bearing of *B* from *A*.

(Give your answers correct to 1 decimal place.)

圖中所示為一個高 50 m 的燈塔 *LO*。一名男子位於燈塔的最高點 *L*，測得位於燈塔正西面的船 *A* 的俯角為 50°；此外，他又測得方位角為 126° 的船 *B* 的俯角為 35°。求

(a) *A* 與 *B* 之間的距離；

(b) 由 *A* 測得 *B* 的真方位角。

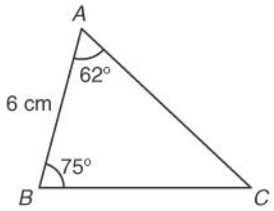
(答案須準確至一位小數。)

25. Find the area of the triangle as shown in the figure.

(Give your answer correct to 3 significant figures.)

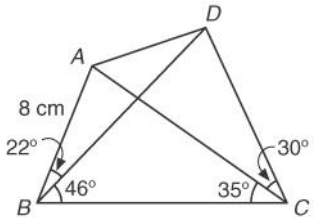
求圖中三角形的面積。

(答案須準確至三位有效數字。)

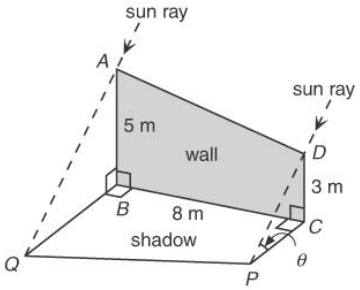


26. In the figure, find AD correct to 3 significant figures.

求圖中的 AD，準確至三位有效數字。



27. In the figure, *ABCD* is a vertical wall. The sun shines from the back of the wall and casts a shadow *QBCP* on the horizontal ground such that *PC* and *QB* are perpendicular to *BC*. *AB* = 5 m, *DC* = 3 m, *BC* = 8 m and the angle of elevation of the sun is θ.



(a) Express *PC* and *QB* in terms of θ.

(b) If the area of the shadow is 40 m^2, find *PC* and *QB*.

(c) If *R* is the mid-point of *PQ*, find the angle of elevation of *A* from *R* correct to the nearest degree.

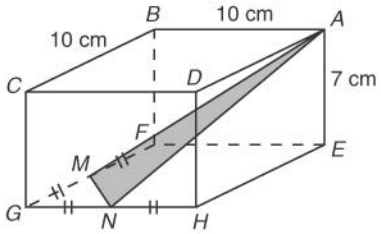
在圖中，*ABCD* 是一堵直立的牆壁。太陽由牆壁的背面照射下來，使牆壁在水平地面上投下影子 *QBCP*，其中 *PC* 和 *QB* 都垂直於 *BC*，而 *AB* = 5 m，*DC* = 3 m，*BC* = 8 m 及太陽的仰角為 θ。

(a) 試以 θ 表示 *PC* 和 *QB*。

(b) 若影子的面積為 40 m^2，求 *PC* 和 *QB*。

(c) 若 *R* 是 *PQ* 的中點，求由 *R* 測得 *A* 的仰角，準確至最接近的度。

28. In the figure, *ABCDHEFG* is a cuboid. *AB* = *BC* = 10 cm, *AE* = 7 cm and *FM* = *MG* = *GN* = *NH*.



(a) **(i)** Find *AM*, *MN* and *AN*.

(ii) Find the area of $\triangle AMN$ by Heron's formula.

(b) Find the angle between *AN* and plane *EFGH*.

(c) Find the angle between the planes *AMN* and *EFGH*.

(Give your answers correct to 2 decimal places.)

圖中所示為長方體 *ABCDHEFG*，其中 *AB* = *BC* = 10 cm，*AE* = 7 cm 及 *FM* = *MG* = *GN* = *NH*。

(a) **(i)** 求 *AM*、*MN* 和 *AN*。

(ii) 利用希羅公式，求 $\triangle AMN$ 的面積。

(b) 求 *AN* 與平面 *EFGH* 的交角。

(c) 求平面 *AMN* 與 *EFGH* 的交角。

(答案須準確至二位小數。)

Pre-requisite Questions
預備測驗

1. Express the following in terms of $\cos x$.

試以 $\cos x$ 表示下列各式。

(a) $\sin^2 x$

(b) $1+\tan^2 x$

(c) $(1+\sin x)^2 - 2\sin x$

2. Express the following in terms of $\sin\theta$.

試以 $\sin\theta$ 表示下列各式。

(a) $\tan\theta\cos\theta$

(b) $(1-\cos^2\theta)(1+\cos^2\theta)$

(c) $\dfrac{1+\dfrac{1}{\tan\theta}}{\sin\theta+\cos\theta}$

3. **(a)** Given that $\cos\theta=\dfrac{15}{17}$ and $\tan\theta<0$, find $\sin\theta$.

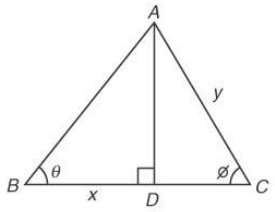
(b) Given that $\tan\theta=-\dfrac{2\sqrt{6}}{5}$ and $\sin\theta>0$, find $\cos\theta$.

(a) 已知 $\cos\theta=\dfrac{15}{17}$ 及 $\tan\theta<0$，求 $\sin\theta$ 的值。

(b) 已知 $\tan\theta=-\dfrac{2\sqrt{6}}{5}$ 及 $\sin\theta>0$，求 $\cos\theta$ 的值。

4. In the figure, if $AD\perp BC$ and BDC is a straight line, express $\dfrac{x}{y}$ in terms of θ and ϕ.

在圖中，若 $AD\perp BC$ 及 BDC 是一條直線，以 θ 及 ϕ 表示 $\dfrac{x}{y}$。



5 Simplify the following expressions.
化簡下列各式。

(a) $\dfrac{(1-\cos\theta)(1+\cos\theta)}{\tan\theta\cos\theta}$

(b) $\dfrac{\cos(360°-\theta)}{\sin(180°+\theta)\tan(90°-\theta)}$

(c) $\dfrac{\cos(180°+\theta)\tan(360°-\theta)}{\cos(90°-\theta)}$

6. Simplify the following expressions.
化簡下列各式。

(a) $\dfrac{\cos\theta}{1+\sin\theta}+\dfrac{1-\sin\theta}{\cos\theta}$

(b) $\dfrac{1}{\dfrac{1}{\sin\theta}-1}-\dfrac{1}{\dfrac{1}{\sin\theta}+1}$

7. If $\tan\theta=-\dfrac{k}{2}$, express $\dfrac{3\cos\theta-4\sin\theta}{2\sin\theta+\cos\theta}$ in terms of *k*.

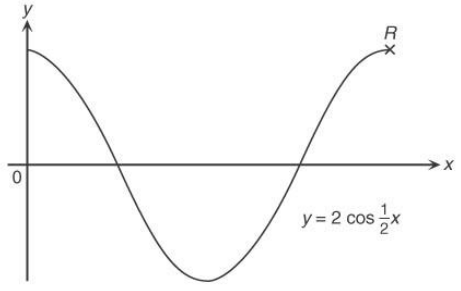
若 $\tan\theta=-\dfrac{k}{2}$，試以 k 表示 $\dfrac{3\cos\theta-4\sin\theta}{2\sin\theta+\cos\theta}$。

8. If $\tan(90°-\theta)=k$, express $\dfrac{\sin\theta}{\tan\theta(\sin^3\theta+\tan\theta\cos^3\theta)}$ in terms of *k*.

若 $\tan(90°-\theta)=k$，試以 k 表示 $\dfrac{\sin\theta}{\tan\theta(\sin^3\theta+\tan\theta\cos^3\theta)}$。

9. The figure shows the graph of $y=2\cos\dfrac{1}{2}x$. Find the coordinates of the point *R*.

下圖所示為 $y=2\cos\dfrac{1}{2}x$ 的圖像。 求 R 點的坐標。



10. Given that $\dfrac{\sin^2 A}{3+4\cos^2 A}=\dfrac{1}{12}$, where $90°<A<180°$, find the value of

已知 $\dfrac{\sin^2 A}{3+4\cos^2 A}=\dfrac{1}{12}$，其中 $90°<A<180°$，求下列各式的值。

(a) $\sin A$,

(b) $\cos A$,

(c) $\dfrac{\sin A}{1-2\cos A}$.

(Leave your answers in surd form.)

(答案以根式表示。)

11 Find the maximum and minimum values of the following functions.

求下列各函數的極大值和極小值。

(a) $y=2-5\cos\theta$

(b) $y=2\cos^2\theta-3\sin^2\theta+1$

(c) $y=\dfrac{3}{4-\cos^2\theta}$

(d) $y=\sin^2\theta-6\sin\theta+9$

***12*.** Prove the following identities.

證明下列各恆等式。

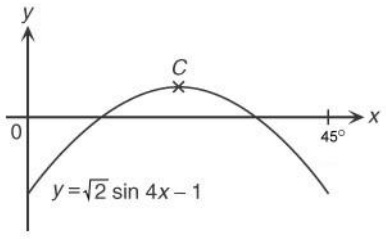
(a) $\tan^2\theta-\sin^2\theta=\tan^2\theta\sin^2\theta$

(b) $\dfrac{\cos A\cos B-\sin A\sin B}{\cos A\cos B+\sin A\sin B}=\dfrac{1-\tan A\tan B}{1+\tan A\tan B}$

(c) $\dfrac{\sin x+\cos x}{\cos x}-\dfrac{\sin x-\cos x}{\sin x}=\dfrac{1}{\cos x\sin x}$

***13*.** In the figure, find the coordinates of the point *C*.

求圖中 *C* 點的坐標。

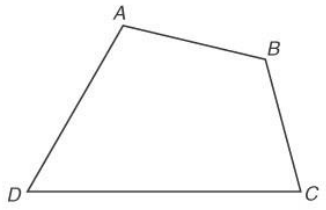


14 In the figure, *ACD* is a right-angled triangle. If $AB = x$ and $\angle ADB = \angle BDC = \theta$, express *CD* in terms of x and θ.

在圖中，△*ACD* 為直角三角形。若 $AB = x$ 及 $\angle ADB = \angle BDC = \theta$，試以 x 及 θ 表示 *CD*。

15. In the figure, *ABCD* is a cyclic quadrilateral. Show that $\tan \angle D = -\tan \angle B$.

在圖中，*ABCD* 為圓內接四邊形。求證 $\tan \angle D = -\tan \angle B$。



16. Solve the following equations for $0° \le \theta < 360°$.

解下列各方程，其中 $0° \le \theta < 360°$。

(a) $2\sin^2\theta - 5\cos\theta + 1 = 0$

(b) $\sin^4\theta = \sin\theta$

(c) $3\tan^4\theta + 5\tan^2\theta - 2 = 0$

17. If $\sin\theta + \cos\theta = k$, express the following in terms of *k*.

若 $\sin\theta + \cos\theta = k$，試以 k 表示下列各式。

(a) $\sin\theta\cos\theta$

(b) $(\cos^2\theta - \sin^2\theta)^2$

18. Solve $2\sin^2\theta + \sin\theta\cos\theta - 6\cos^2\theta = 0$ for $0° \le \theta \le 360°$, correct your answers to the nearest 0.1°.

解 $2\sin^2\theta + \sin\theta\cos\theta - 6\cos^2\theta = 0$，其中 $0° \le \theta \le 360°$，答案須準確至最接近的 0.1°。

Level 1 Questions

程度 1 題目

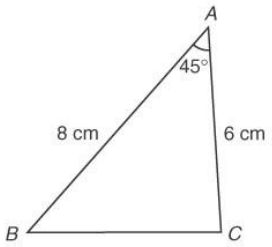
1. Find the areas of the following triangles.

(Give your answers correct to 3 significant figures if necessary.)

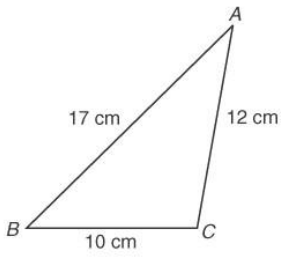
求下列各三角形的面積。

（如有需要，取答案準確至三位有效數字。）

(a)



(b)



2. In the figure, *ABCDEF* is a regular hexagon with sides 10 cm and is inscribed in a circle with centre *O*.

(a) Find $\angle OBA$ and the area of $\triangle OAB$.

(b) Find the area of the shaded segment.

(Leave your answers in surd form.)

在圖中， *ABCDEF* 是一個邊長為 10 cm 的正六邊形，且內接於一個圓心為 *O* 的圓形。

(a) 求 $\angle OBA$ 及$\triangle OAB$ 的面積。

(b) 求陰影區域的面積。

（答案以根式表示。）

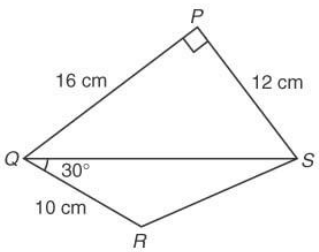
3. Find the areas of the following quadrilaterals.

(Give your answers correct to 3 significant figures if necessary.)

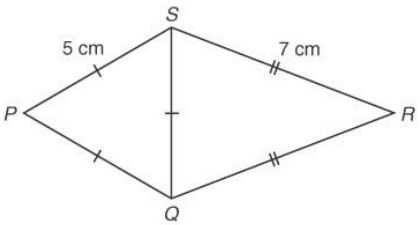
求下列各四邊形的面積。

（如有需要，取答案準確至三位有效數字。）

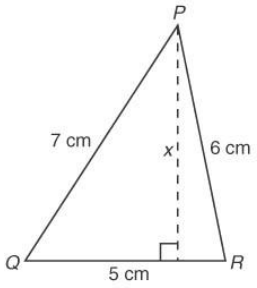
(a)



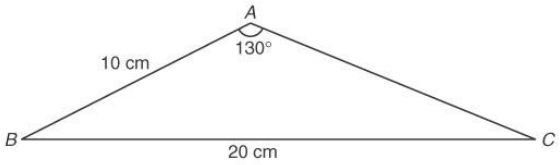
(b)



4. In the figure, find the value of x correct to 3 significant figures.
求圖中 x 的值，準確至三位有效數字。



5. In $\triangle ABC$, $A = 130°$, $BC = 20$ cm and $AB = 10$ cm. Find B correct to the nearest 0.1°.
在 $\triangle ABC$ 中，$A = 130°$，$BC = 20$ cm 及 $AB = 10$ cm。求 B ，準確至最接近的 0.1°。



6. In the figure, ADB is a straight line, $\angle CAD = 46°$, $\angle CDB = 85°$, $\angle DBC = 32°$ and $CD = 6$ cm. Find
在圖中， ADB 是一條直線， $\angle CAD = 46°$，$\angle CDB = 85°$，$\angle DBC = 32°$ 及 $CD = 6$ cm。求

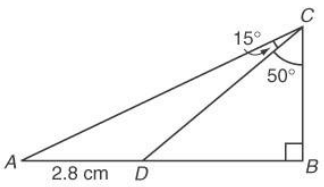
(a) AD,

(b) DB,

(c) the area of $\triangle DBC$.
$\triangle DBC$ 的面積。

(Give your answers correct to 3 significant figures.)
（答案須準確至三位有效數字。）

7. In the figure, ABC is a right-angled triangle with $\angle ABC = 90°$. D is a point on AB such that $\angle BCD = 50°$, $\angle DCA = 15°$ and $AD = 2.8$ cm. Find
在圖中， ABC 是一個直角三角形，且$\angle ABC = 90°$。 D 是 AB 上的一點，使$\angle BCD = 50°$，$\angle DCA = 15°$ 及 $AD = 2.8$ cm.。求



(a) AC,

(b) BC.

(Give your answers correct to 3 significant figures.)
（答案須準確至三位有效數字。）

8. In the figure, *ABCD* is a trapezium, $\angle BAD = \angle CDA = 90°$, $AC = 7$ cm, $\angle ACB = 63°$ and $\angle ACD = 40°$. Find

在圖中，*ABCD* 是一個梯形，其中$\angle BAD = \angle CDA = 90°$，$AC = 7$ cm，$\angle ACB = 63°$ 及$\angle ACD = 40°$。求

(a) $\angle ABC$,

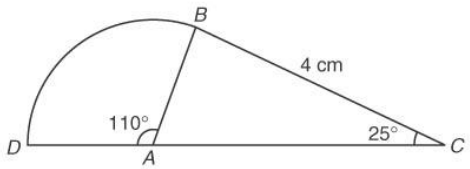
(b) AB,

(c) the area of the trapezium. 該梯形的面積。

(Give your answers correct to 3 significant figures if necessary.)

（如有需要，取答案準確至三位有效數字。）

9. A plane figure *DBC* consists of a sector *ABD* with center at *A* and a triangle *ABC* where $BC = 4$ cm and $\angle ACB = 25°$. *DAC* is a straight line. Find



(a) the lengths of *AB* and *AC*,

(b) the area of the plane figure *DBC*.

(Give your answers correct to 3 significant figures.)

平面圖形 *DBC* 是由一個以 *A* 為圓心的圓的扇形 *ABD* 和一個三角形 *ABC* 所組成。其中 $BC = 4$ cm 及$\angle ACB = 25°$，而 *DAC* 是一條直線。 求

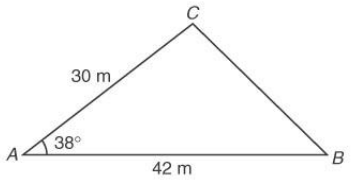
(a) *AB* 和 *AC* 的長度；

(b) 平面圖 *DBC* 的面積。

（答案須準確至三位有效數字。）

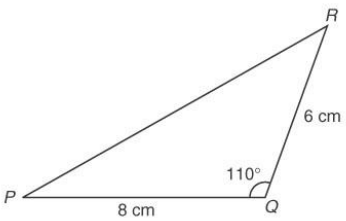
10. In the figure, find *BC* correct to 3 significant figures.

求圖中的 *BC* 的長度。答案須準確至三位有效數字。

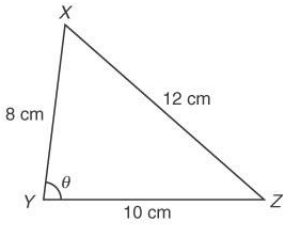


11. In the figure, find *PR* correct to 3 significant figures.

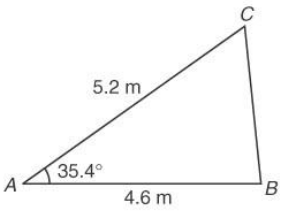
求圖中的 *BC* 的長度。答案須準確至三位有效數字。



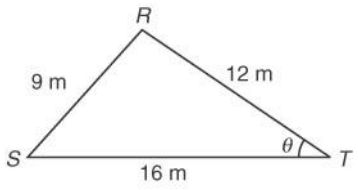
12. In the figure, find θ correct to the nearest 0.1°.
求圖中的θ的值。答案須準確至最接近的 0.1°。



13. In $\triangle ABC$, AC = 5.2 m, AB = 4.6 m and A = 35.4°. Solve $\triangle ABC$.
(Give your answers correct to 1 decimal place.)
在$\triangle ABC$ 中，b = 5.2 m，c = 4.6 m 及 A = 35.4°。解$\triangle ABC$。
（答案須準確至一位小數。）



14. In the figure, find θ correct to the nearest 0.1°.
求圖中的θ的值。答案須準確至最接近的 0.1°。



15. In $\triangle ABC$, $\angle A : \angle B : \angle C$ = 3 : 4 : 5 and BC = 4 cm, find AB and AC correct to 3 significant figures.
在 $\triangle ABC$ 中，$\angle A : \angle B : \angle C$ = 3 : 4 : 5 及 BC = 4 cm。求 AB 和 AC，準確至三位有效數字。

16. In $\triangle ABC$, AB = 10 cm, BC = 12 cm, AC = 14 cm, M is a point on BC such that $BM : MC$ = 2 : 1. Find

(a) cos $\angle ACB$,

(b) AM.

(Give your answers in surd form if necessary.)
在$\triangle ABC$ 中，AB = 10 cm，BC = 12 cm， AC = 14 cm。 M 是 BC 上的一點，使 $BM : MC$ = 2 : 1。求

(a) cos $\angle ACB$；

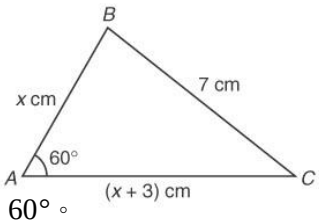
(b) AM。

（如有需要，答案以根式表示。）

17. In $\triangle ABC$, $a = 8$ cm, $b = 12$ cm and $C = 102°$. Solve $\triangle ABC$.
(Give your answers correct to 1 decimal place.)
在 $\triangle ABC$ 中，$a = 8$ cm， $b = 12$ cm 及 $C = 102°$。解$\triangle ABC$。
（答案須準確至一位小數。）

18. In $\triangle ABC$, $AB = 10$ cm, $BC = 17$ cm and $CA = 21$ cm. Find
(a) cos $\angle BAC$,
(b) the area of $\triangle ABC$.
在 $\triangle ABC$ 中，$AB = 10$ cm， $BC = 17$ cm 及 $CA = 21$ cm。求
(a) cos $\angle BAC$；
(b) $\triangle ABC$ 的面積。

19. In $\triangle ABC$, $AB = x$ cm, $BC = 7$ cm, $CA = (x + 3)$ cm and $A = 60°$.
(a) Show that $x^2 + 3x - 40 = 0$.
(b) Find the value of x.
(c) Find B and C correct to the nearest 0.1°.



在$\triangle ABC$ 中，$AB = x$ cm，$BC = 7$ cm，$CA = (x + 3)$ cm 及 $A = 60°$。
(a) 證明 $x^2 + 3x - 40 = 0$。
(b) 求 x 的值。
(c) 求 B 和 C 。答案須準確至最接近的 0.1°。

*20***.** In the figure, QS divides the quadrilateral $PQRS$ into two triangles PQS and QRS of equal areas. $SP = 7$ cm, $QR = 3$ cm, $RS = 4$ cm and $\angle QRS = 90°$. Find
(a) QS,
(b) $\angle PSQ$,
(c) the perimeter of $PQRS$.
(Give your answers correct to 3 significant figures if necessary.)
在圖中，QS 把四邊形 $PQRS$ 分為兩個面積相等的三角形 PQS 和 QRS 。若 $SP = 7$ cm，$QR = 3$ cm，$RS = 4$ cm 及$\angle QRS = 90°$。求
(a) QS；
(b) $\angle PSQ$；
(c) $PQRS$ 的周界。
（如有需要，取答案準確至三位有效數字。）

21. In the figure, *ABCD* is a rhombus of side 25 cm. If $\angle BAC = 50°$, find

(a) *AC*,

(b) *BD*.

(Give your answers correct to 4 significant figures.)

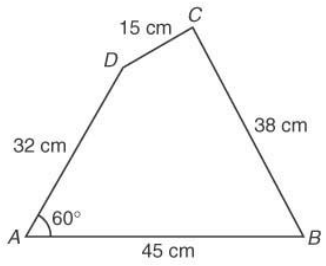
在圖中， *ABCD* 是一個邊長為 25 cm 的菱形。若$\angle BAC = 50°$，求

(a) *AC*；

(b) *BD*。

（答案須準確至四位有效數字。）

22. In the figure, *ABCD* is a quadrilateral, *AB* = 45 cm, *BC* = 38 cm, *CD* = 15 cm, *DA* = 32 cm and $\angle DAB = 60°$. Find



(a) *BD*,

(b) $\angle BCD$,

(c) the area of quadrilateral *ABCD*.

(Give your answers correct to 3 significant figures.)

在圖中，*ABCD* 是一個四邊形，其中 *AB* = 45 cm，*BC* = 38 cm，*CD* = 15 cm，*DA* = 32 cm 及$\angle DAB = 60°$。求

(a) *BD*；

(b) $\angle BCD$；

(c) 四邊形 *ABCD* 的面積。

（答案須準確至三位有效數字。）

23. In the figure, *PQ* and *RS* are two vertical buildings on a horizontal ground. If *PQ* = 45 m, *PR* = 50 m and *QR* = 60 m, find

(a) the angle of depression of *R* from *P*,

(b) the height of building *RS*.

(Give your answers correct to 3 significant figures.)

在圖中， *PQ* 和 *RS* 是兩座建築物。若 *PQ* = 45 m，*PR* = 50 m 及 *QR* = 60 m，求

(a) 由 *P* 測得 *R* 的俯角；

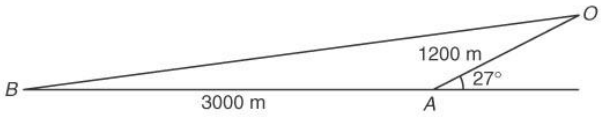
(b) 建築物 *RS* 的高度

（答案須準確至三位有效數字。）

24 In the figure, *A* and *B* are two points on a horizontal road. *B* is 3000 m due west of *A*. A balloon *O* is above road *AB* and makes an angle of elevation of 27° from *A*. If the distance of the balloon from *A* is 1200 m, find

(a) the distance *OB*,

(b) the angle of elevation of the balloon from *B*.



(Give your answers correct to the nearest integer.)

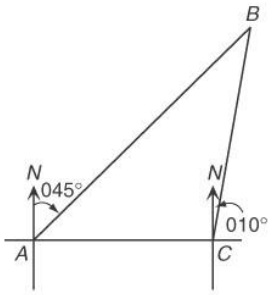
在圖中，*A* 和 *B* 是水平地面上的兩點。*B* 位於 *A* 的西面 3000 m 處。一個汽球 *O* 位於路面 *AB* 的正上方，由 *A* 測得汽球的仰角是 27°。若汽球與 *A* 相距 1200 m，求

(a) *OB* 的距離；

(b) 由 *B* 測得汽球的仰角。

（答案須準確至最接近的整數。）

25. At noon, a ship starts sailing from island *A* and the true bearing of island *B* from island *A* is 045°. The ship sails in a east course at a speed of 25 km/h and arrive at island *C* after 2 hours. If the true bearing of island *B* from island *C* is 010°, find the distance between islands *B* and *C* correct to 3 significant figures.

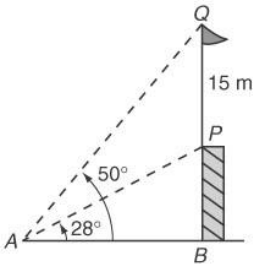


在正午時，一艘輪船從小島 *A* 出發。由小島 *A* 測得小島 *B* 的真方位角是 045°。輪船以 25 km/h 的速率向東面航行，在兩小時後，抵達小島 *C*。若由小島 *C* 測得小島 *B* 的真方位角是 010°，求小島 *B* 和小島 *C* 之間的距離，答案須準確至三位有效數字。

26. In the figure, *PQ* is a flagstaff on the top of a building *PB*. From a point *A* on the ground, the angles of elevation of *P* and *Q* are 28° and 50° respectively. Find

(a) *AP*,

(b) the height of the building *PB*.



(Give your answers correct to 3 significant figures.)

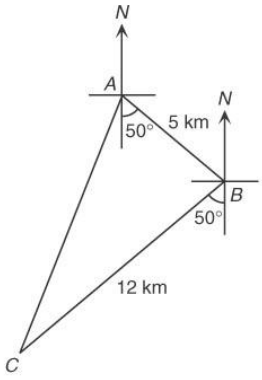
在圖中，*PQ* 是位於大廈 *PB* 最高點的一根旗桿。由地面上的一點 *A* 測得 *P* 和 *Q* 的仰角分別為 28° 和 50°。求

(a) *AP*；

(b) 大廈 *PB* 的高度。

（答案須準確至三位有效數字。）

27. The figure shows three cities *A*, *B* and *C*. The compass bearing of *B* from *A* is S50°E and the compass bearing of *C* from *B* is S50°W. It is known that *AB* and *BC* are 5 km and 12 km respectively. Find



(a) *AC*,

(b) the compass bearing of *C* from *A*.

(Give your answers correct to 3 significant figures.)

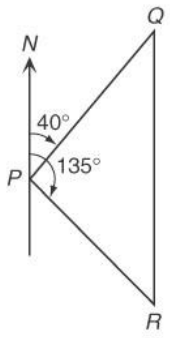
圖中所示為三個城市 *A*、*B* 和 *C*。由 *A* 測得 *B* 的羅盤方位角是 S50°E ，而由 *B* 測得 *C* 的羅盤方位角則是 S50°W。已知 *AB* 和 *BC* 分別為 5 km 和 12 km。求

(a) *AC*；

(b) 由 *A* 測得 *C* 的羅盤方位角。

（答案須準確至三位有效數字。）

28. A ship *L* left a port *P* at noon and traveled at a speed of 24 km/h in a direction of 040° . Another ship *M* left the port *P* at 1:00 p.m. and traveled in a direction of 135°. At 3:00 p.m., the ship L and ship *M* arrive at *Q* and *R* respectively.



(a) Find *PQ*.

(b) If *R* is due south of *Q*, find

(i) the average speed of ship *M*,

(ii) the distance between ship *L* and ship *M*.

(Give your answers correct to 3 significant figures if necessary.)

. 一艘船 *L* 於正午時由港口 *P* 出發，以 24 km/h 的速率沿 040° 的方向航行。另一艘船 *M* 於 1:00 p.m. 由港口 *P* 出發，沿 135°的方向航行。在 3:00 p.m.，船 *L* 和船 *M* 分別抵達 *Q* 和 *R*。

(a) 求 *PQ*。

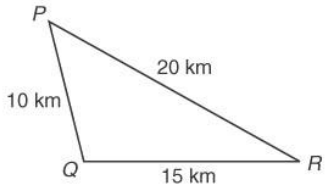
(b) 若 *R* 位於 *Q* 的正南面，求

(i) 船 *M* 的平均速率；

(ii) 船 *L* 和船 *M* 之間的距離。

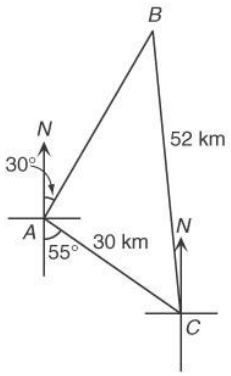
（如有需要，取答案準確至三位有效數字。）

29. The figure shows three islands, *P*, *Q* and *R*, *PQ* = 10 km, *QR* = 15 km, *PR* = 20 km and *R* is due east of *Q*. Find the true bearing of *R* from *P* correct to 3 significant figures.



圖中所示為三個島嶼 *P*、*Q* 和 *R*。*PQ* = 10 km，*QR* = 15 km， *PR* = 20 km，而 *R* 則位於 *Q* 的正東面。求由 *P* 測得 *R* 的真方位角。答案須準確至三位有效數字。

30. The compass bearing of a lighthouse *B* from a ship at *A* is N30° E. The ship leaves *A* and sails on a course of S55°E for 30 km to a port *C*. Find the compass bearing of *B* from *C* correct to 3 significant figures.



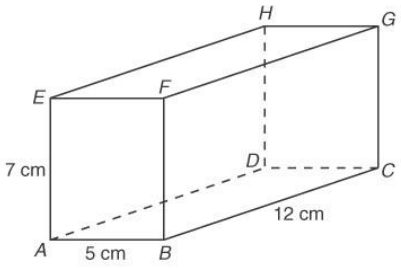
由一艘位於 *A* 的船測得燈塔 *B* 的羅盤方位角為 N30° E。該艘船從 *A* 沿 S55°E 航行了 30 km ，抵達港口 *C*。求由 *C* 測得 *B* 的羅盤方位角。答案須準確至三位有效數字。

31. The figure shows a rectangular block *ABCDHEFG* with *AE* = 7 cm, *AB* = 5 cm and *BC* = 12 cm. Find the angles between

(a) *BH* and *BD*,

(b) *BH* and the plane *DCGH*.

(Give your answers correct to 3 significant figures.)



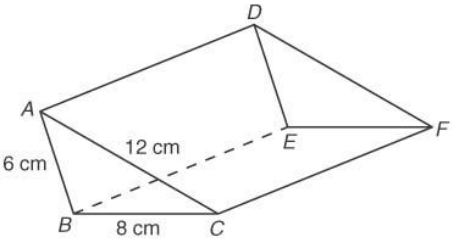
圖中所示為一個長方體 *ABCDHEFG*，其中 *AE* = 7 cm，*AB* = 5 cm 及 *BC* = 12 cm。求

(a) *BH* 與 *BD* 的交角；

(b) BH 與平面 *DCGH* 的交角。

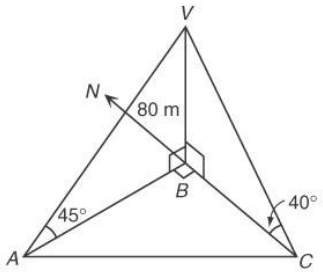
(答案須準確至三位有效數字。)

32. The figure shows a right triangular prism *ABCFDE*. If *AB* = 6 cm, *BC* = 8 cm and *AC* = 12 cm, find the angle between planes *ACFD* and *BCFE* correct to 3 significant figures.



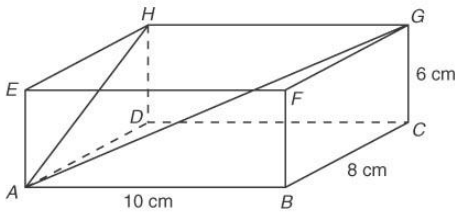
圖中所示為一個直立三稜柱 *ABCFDE* 。若 *AB* = 6 cm，*BC* = 8 cm 及 *AC* = 12 cm，求平面 *ACFD* 與 *BCFE* 的交角。答案須準確至三位有效數字。

33. In the figure, *VB* is a vertical post of height 80 m. Point *A* and *C* are due west and due south of *B* respectively. If the angle of elevation of *V* from *A* and *B* are 45° and 40° respectively, find the compass bearing of *A* form *C*.



在圖中，*VB* 是一根高度為 80 m 的柱子。*A* 和 *C* 分別位於 *B* 的正西面和正南面。若由 *A* 和 *B* 測得 *V* 的仰角分別為 45° 和 40°，求由 *C* 測得 *A* 的羅盤方位角。

34. The figure shows a rectangular block *ABCDHEFG* of dimension $10\,\text{cm} \times 8\,\text{cm} \times 6\,\text{cm}$.



(a) Find *AH* and *AG*.
(Leave your answers in surd form if necessary.)

(b) Find the angle between *AH* and *AG*.

(c) Find the angle between *AH* and *AC* correct to 3 significant figures.

在圖中，*ABCDHEFG* 是一個大小為 10 cm × 8 cm × 6 cm 的長方體。

(a) 求 *AH* 和 *AG*。
（如有需要，答案以根式表示。）

(b) 求 *AH* 與 *AG* 的交角。

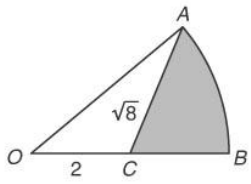
(c) 求 *AH* 與 *AC* 的交角。答案須準確至三位有效數字。

Level 2 Questions

程度 2 題目

1. In the figure, *OAB* is a sector of a circle with centre *O*. *C* is the mid-point of *OB*

such that $CA = \sqrt{8}$ and *OC* = 2. Find



(a) ∠*AOB*,

(b) the area of the shaded part.

(Give your answer correct to 3 significant figures.)

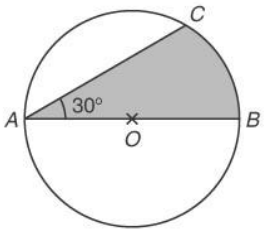
在圖中，*OAB* 是一個以 *O* 為圓心的圓的扇形。*C* 是 *OB* 的中點，使 $CA = \sqrt{8}$ 及 *OC* = 2。求

(a) ∠*AOB*；

(b) 陰影區域的面積。

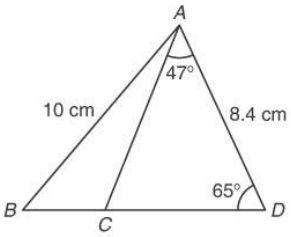
(答案須準確至三位有效數字。)

2 In the figure, *O* is the centre of the circle with *AB* as a diameter. If ∠*CAB* = 30° and the area of the shaded region is $\left(25\sqrt{3}+\frac{50\pi}{3}\right)\text{cm}^2$, find the radius of the circle.



在圖中，*O* 是圓的圓心，而 *AB* 是圓的直徑。若∠*CAB* = 30° 及陰影區域的面積是$\left(25\sqrt{3}+\frac{50\pi}{3}\right)\text{cm}^2$，求圓的半徑。

3. In the figure, *BCD* is a straight line, $\angle CAD = 47°$, $\angle ADC = 65°$, *AB* = 10 cm and *AD* = 8.4 cm. Find



(a) *AC*,

(b) ∠*BAC*,

(c) the area of △*ABD*.

(Give your answers correct to 3 significant figures.)

在圖中，*BCD* 是一條直線， $\angle CAD = 47°$，$\angle ADC = 65°$，*AB* = 10 cm 及 *AD* = 8.4 cm。求

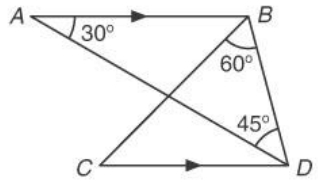
(a) *AC*；

(b) ∠*BAC*；

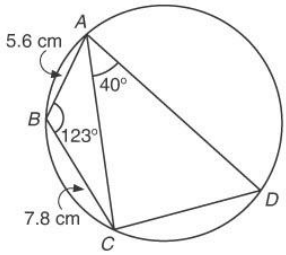
(c) △*ABD* 的面積。

(答案須準確至三位有效數字。）

4. In the figure, AB // CD, $\angle BAD = 30°$, $\angle CBD = 60°$ and $\angle BDA = 45°$ Find $AB : CD$.
在圖中，AB // CD，$\angle BAD = 30°$，$\angle CBD = 60°$ 及 $\angle BDA = 45°$。求 $AB : CD$。



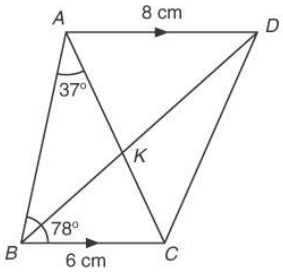
5. In the figure, $ABCD$ is a cyclic quadrilateral. $AB = 5.6$ cm, $BC = 7.8$ cm, $\angle ABC = 123°$ and $\angle CAD = 40°$. Find
(a) AC,
(b) the area of the quadrilateral $ABCD$.
(Give your answers correct to 3 significant figures.)
在圖中，$ABCD$ 是一個圓內接四邊形。$AB = 5.6$ cm，$BC = 7.8$ cm，$\angle ABC = 123°$及$\angle CAD = 40°$。求
(a) AC；
(b) 四邊形 $ABCD$ 的面積。
(答案須準確至三位有效數字。)



6. In $\triangle ABC$, $AC = 10$, $AB = 12$ and $\sin\angle A = \frac{\sqrt{7}}{4}$. Find $\angle B$ and $\angle C$ correct to 3 significant figures.

在$\triangle ABC$ 中，$AC = 10$、$AB = 12$ 及 $\sin\angle A = \frac{\sqrt{7}}{4}$，求$\angle B$ 和$\angle C$ 。答案須準確至三位有效數字。

7. In the figure, AD // BC, $\angle BAC = 37°$, $\angle ABC = 78°$, $BC = 6$ cm and $AD = 8$ cm. Diagonals AC and BD intersect at K. Find
(a) AC,
(b) $\angle AKD$.
(Give your answers correct to 3 significant figures.)
在圖中，AD // BC，$\angle BAC = 37°$，$\angle ABC = 78°$，$BC = 6$ cm 及 $AD = 8$ cm。對角線 AC 與 BD 相交於 K。求
(a) AC；
(b) $\angle AKD$。
(答案須準確至三位有效數字。)



8. In the figure, *ABCDEF* is a hexagon. Find

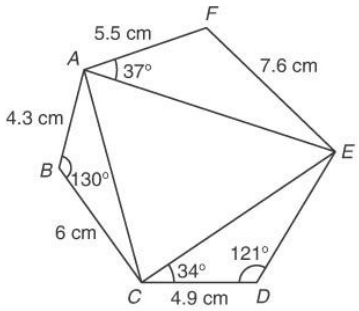
(a) *AC*, *CE* and *EA* correct to 3 significant figures,

(b) the area of △*ACE* by Heron's formula correct to the nearest integer.

在圖中，*ABCDEF* 是一個六邊形。求

(a) *AC*，*CE* 和 *EA*，答案須準確至三位有效數字；

(b) 利用希羅公式，求△*ACE* 的面積。答案須準確至最接近的整數。



9. In the figure, △*ABD* is inscribed in the circle with centre *O*. *C* is a point on *BD* so that *BC* = 10 cm, ∠*ABC* = 35°, ∠*ACB* = 62° and ∠*CAD* = 32°. Find

(a) *AC*,

(b) *CD*,

(c) the radius of the circle

(Give your answers correct to 3 significant figures.)

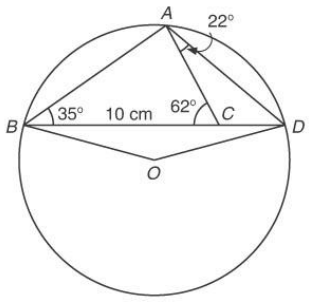
在圖中，△*ABD* 內接於一個圓心為 *O* 的圓。*C* 是 *BD* 上的一點，使 *BC* = 10 cm，∠*ABC* = 35°，∠*ACB* = 62°及∠*CAD* = 32°。求

(a) *AC*；

(b) *CD*；

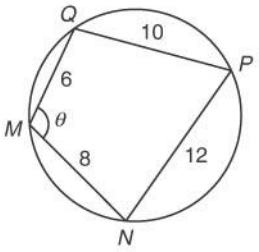
(c) 圓的半徑。

(答案須準確至三位有效數字。)



10. In the figure, *MNPQ* is a cyclic quadrilateral, *MN* = 8, *NP* = 12, *PQ* = 10 and *QM* = 6, Find θ correct to 3 significant figures.

在圖中，*MNPQ* 是一個圓內接四邊形，其中 *MN* = 8，*NP* = 12，*PQ* = 10 及 *QM* = 6，求 θ。答案須準確至三位有效數字。



11. In △*OAB*, *AC* : *CB* = 1: 2, ∠*AOB* = 120°, *OA* = 2 cm and *OB* = 4 cm. Find

(a) cos ∠*OAC*,

(b) *CO*.

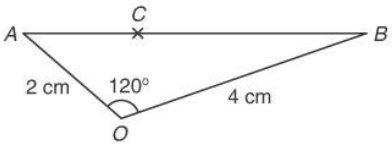
(Give your correct your answers to 3 significant figures if necessary.)

在△*OAB* 中，*AC* : *CB* = 1: 2，*OA* = 2 cm 及 *OB* = 4 cm。求

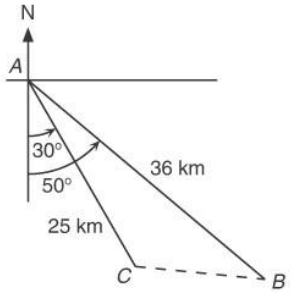
(a) cos ∠*OAC*；

(b) *CO*。

(如有需要，取答案準確至三位有效數字。)



12. Port *B* is on a bearing of S50°E from port *A* and 36 km apart. A boat leaves from port *A* and reaches island *C* which is on a bearing of S30°E and 25 km from port *A*.



(a) Find the distance between *B* and *C* correct to the nearest km,

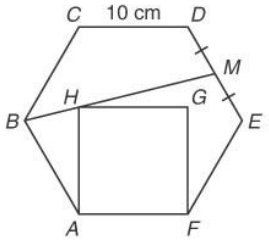
(b) What should be the direction of the boat in order to sail from *C* to *B* directly?

由港口 *A* 測得 36 km 外的港口 *B* 的方位角是 S50°E。一艘小艇從港口 *A* 出發，抵達小島 *C* 。由港口 *A* 測得小島 *C* 的方位是 S30°E 及 25 km。

(a) 求 *B* 與 *C* 之間的距離，答案須準確至最接近的 km；

(b) 若從 *C* 直接航行至 *B*，小艇須向哪個方向航行？

13. In the figure, *ABCDEF* is a regular hexagon of side 10 cm and *AFGH* is a rectangle. *M* is the mid-point of *DE* and *BHE* is a straight line.



(a) *BM*,

(b) *AH* correct to 3 significant figures.

在圖中，*ABCDEF* 是一個邊長為 10 cm 的正六邊形，而 *AFGH* 則是一個長方形。*M* 是 *DE* 的中點，而 *BHE* 是一條直線。求

(a) *BM*；

(b) *AH* 。答案須準確至三位有效數字。

14. Three ships *A*, *B* and *C* leave from a port *O* at the same time. Ship *A* sails at 6km/h on a course of N 45° E, ship *B* is sailing due west and ship *C* is sailing due east. After 3 hours , the distance between ship *A* and ship *B* is 27 km.

(a) Find the speed of ship *B*.

(b) If the speed of ship *C* is the same as that of ship *B*, Find the distance between *A* and *C* after 2 hours.

(Give your answers correct to 3 significant figures.)

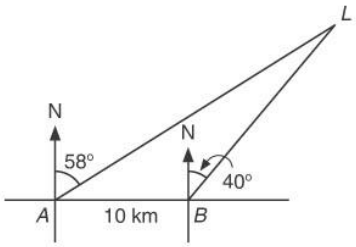
三艘船 *A*、*B* 和 *C* 同時從港口 *O* 出發。船 *A* 以 6km/h 的速率沿 N 45° E 的方向航行，船 *B* 向西航行，而船 *C* 則向東航行。3 小時後，船 *A* 與船 *B* 之間的距離為 27 km。

(a) 求船 *B* 的速率。

(b) 若船 *C* 的速率與船 *B* 相同，求 2 小時後 *A* 與 *C* 之間的距離。

(答案須準確至三位有效數字。)

15. A boat sails due east from A and the bearing of a lighthouse L from A is N58°E. After the boat travels 10 km to a point B, the bearing of L from the boat is N40°E.



(a) Find the distance between A and L.

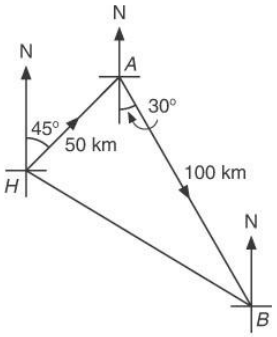
(b) If the boat continues sailing due east, find the shortest distance between the boat and the lighthouse.

一艘小艇從 A 出發向着正東面航行。由 A 測得燈塔 L 的方位角是 N58°E。當小艇航行了 10 km 至 B 點時，由小艇測得 L 的方位角是 N40°E。

(a) 求 A 與 L 之間的距離。

(b) 若小艇繼續向東航行，求小艇與燈塔之間最短的距離。

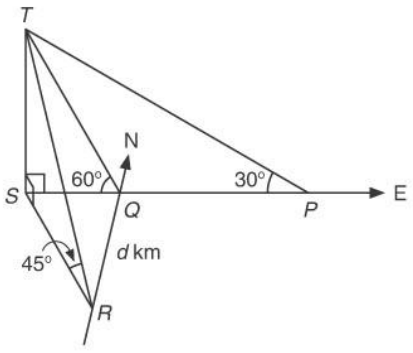
16. A ship leaves the harbour H and sails 50 km on a course of N45°E to harbour A. Then it sails 100 km on the course of S30°E to harbour B. Find the compass bearing of H from B correct to 3 significant figures.



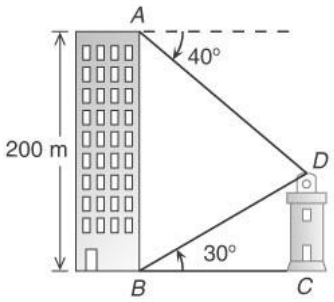
一艘船從港口 H 出發，沿 N45°E 的方向航行了 50 km，抵達港口 A。稍後該船沿 S30°E 的方向航行了 100 km，抵達港口 B。求由 B 測得 H 的羅盤方位角，答案須準確至三位有效數字。

17. In the figure, P,Q and R are three points on a horizontal plane. TS is a tower due west of P and Q. R is d km due south of Q. The angles of elevation of T from P, Q and R are 30°, 60° and 45° respectively, express PQ in terms of d.

在圖中，P、Q 和 R 是水平面上的三點。TS 是位於 P 和 Q 正西面的一座塔。R 位於 Q 正南面 d km 的位置。由 P，Q 和 R 測得 T 的仰角分別為 30°、60° 和 45°。試以 d 表示 PQ。



18. When a man stands on the ground of a building *AB* of height 200 m, the angle of elevation of the top of a tower *CD* is 30°. If he observes the tower again from the top of the building, the angle of depression of the top of the tower is 40°.
一名男子由 200 m 高的大廈 *AB* 地面測得塔 *CD* 的仰角是 30°。若他從大廈頂部觀察該塔，測得塔頂的俯角是 40°。



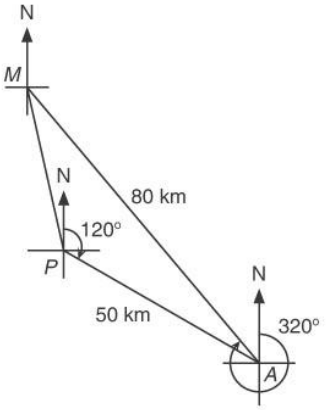
(a) Find the height of the tower.

(b) If the man stand on the midway *F* of tower *CD*, find the angle of elevation of *A* from *F*.
(Give your answers correct to 3 significant figures.)

(a) 求塔的高度。

(b) 若該男子到達塔 *CD* 中間位置 *F* ，求由 *F* 測得 *A* 的仰角。
(答案須準確至三位有效數字。)

19. A boat leaves island *P* and sails 50 km on a course of 120° to island *A*. Then, the boat sails 80 km on a course of 320° to an island *M*. Find



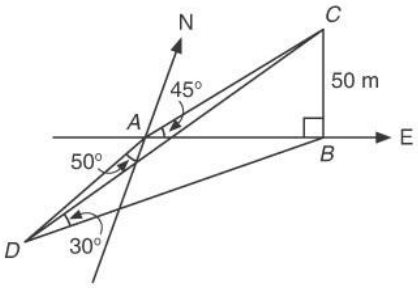
(a) the distance between island *M* and island *P*,

(b) the true bearing in which the boat return to island *P*.
(Correct your answer to 3 significant figures.)
一艘小艇從小島 *P* 出發，沿 120°的方向航行了 50 km，抵達小島 *A*。其後小艇沿 320°的方向航行了 80 km，抵達小島 *M*。求

(a) 小島 *M* 與小島 *P* 之間的距離；

(b) 小艇返回小島 *P* 的真方位角。
（答案須準確至三位有效數字。）

20. A building *BC* of height 50 m and *A*, *B* and *D* are three points on the horizontal ground. *B* is due east of *A* and the angle of elevation of *C* from *A* is 45°.The compass bearing of *D* from *A* is S50°W from *A*, the angle of elevation of *C* from *D* is 30°.



(a) Find *AB* and *BD*. (Leave your answers in surds form)

(b) Find ∠*ABD* correct to 3 significant figures.

(c) If *R* is a point on *BD* such that *AR* ⊥ *BD*, find the angle of elevation of *C* from *R*, correct your answer to 3 significant figures.

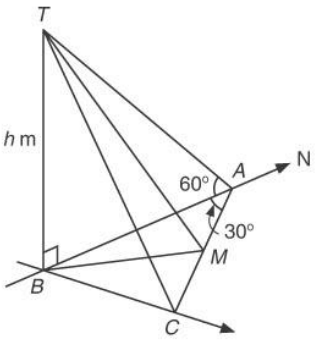
一幢大廈 *BC* 高 50 m，而 *A*、*B* 和 *D* 是水平地面上的三點。*B* 位於 *A* 的正東面，由 *A* 測得 *C* 的仰角是 45°。由 *A* 測得 *D* 的羅盤方位角是 S50°W，而由 *D* 測得 *C* 的仰角則是 30°。

(a) 求 *AB* 和 *BD*。（答案以根式表示。）

(b) 求∠*ABD* ，答案須準確至三位有效數字。

(c) 若 *R* 是 *BD* 上的一點，使 *AR* ⊥ *BD*，求由 *R* 測得 *C* 的仰角。答案須準確至三位有效數字。

21 In the figure, a car *A* originally is due north of a building *TB* and the angle of elevation of *T* from *A* is 60°. The car then travels on a course of S 30° E until it reaches *C* which is due east of the building. *M* is the mid-point of *AC*. Let *TB* = *h* m.



(a) **(i)** Express *AB* and *BC* in terms of *h*.

(ii) Find the angle of elevation of *T* from *C*.

(Correct your answers to 3 significant figure)

(b) If *AC* = 100 m, find

(i) *h*,

(ii) *BM*,

(iii) the angle of elevation of *M* from *T*.

(Give your answer correct to 3 significant figures if necessary)

在圖中，房車 *A* 位於大廈 *TB* 的正北面，由 *A* 測得 *T* 的仰角是 60°。房車稍後沿 S 30° E 的方向行駛，直至抵達大廈正東面的 *C* 點。*M* 是 *AC* 的中點。設 *TB* = *h* m。

(a) **(i)** 試以 *h* 表示 *AB* 和 *BC*。

(ii) 求由 *C* 測得 *T* 的仰角。（答案須準確至三位有效數字。）

(b) 若 *AC* = 100 m，求

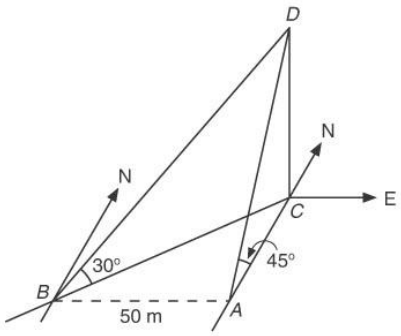
(i) *h*；

(ii) *BM*；

(iii) 由 *T* 測得 *M* 的仰角。

(如有需要，取答案準確至三位有效數字。）

22. In the figure, a vertical pole *CD* stands on the horizontal ground *ABC*. The top of the pole *D* is due north of *A* and the angle of elevation of *D* from *A* is 45°. The bearing and the angle of elevation of *D* from *B* are N60°E and 30° respectively. If *AB* = 50m, find



(a) *CD*,

(b) the compass bearing of *A* from *B*.

(Give your answers correct to 3 significant figures.)

在圖中，一根垂直的柱子 *CD* 位於水平面 *ABC* 上。柱子頂部 *D* 位於 *A* 的正北面，而由 *A* 測得 *D* 的仰角則是 45°。由 *B* 測得 *D* 的方位角和仰角分別為 N60°E 和 30°。若 *AB* = 50m，求

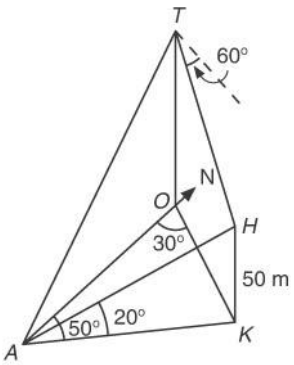
(a) *CD*；

(b) 由 *B* 測得 *A* 的羅盤方位角。

(答案須準確至三位有效數字。）

23. In the figure, *OT* is a tower and *HK* is a building of height 50 m. *O*, *K* and *A* are three points on the horizontal ground in which *A* is due south of *O*. The bearing of *K* from *A* and *O* are N50°E and S30°E respectively. The angle of elevation of *H* from *A* is 20° and the angle of depression of *H* from *T* is 60°.

在圖中，*OT* 是一座塔，而 *HK* 是一幢 50 m 高的大廈。*O*、*K* 和 *A* 是水平地面上的三點，當中 *A* 位於 *O* 的正南面。由 *A* 和 *O* 測得 *K* 的方位角分別是 N50°E 和 S30°E。由 *A* 測得 *H* 的仰角是 20° ，而由 *T* 測得 *H* 的俯角則是 60°。求



Find

(a) *OK* and *OT*,

(b) the angle of elevation of *T* from *A*.

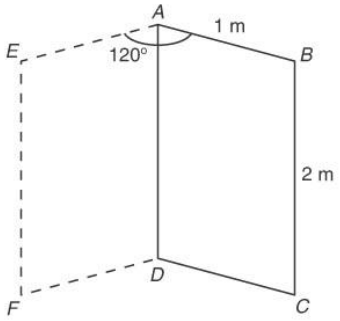
(Give your answers correct to 3 significant figures.)

(a) *OK* 和 *OT*；

(b) 由 *A* 測得 *T* 的仰角。

(答案須準確至三位有效數字。)

24. In the figure, a door *ABCD* of size 1m × 2m is turned through 120° along *AD* to the position *AEFD*. Find



(a) *EC*, leaving your answer in surd form,

(b) ∠*EDB*, correcting your answer to 3 significant figures,

(c) the angle between *AD* and plane *EDB*, correcting your answer to 3 significant figures.

在圖中，一扇大小為 1m × 2m 的門 *ABCD* 沿 *AD* 轉動了 120° ，到達了 *AEFD* 的位置。求

(a) *EC*，答案以根式表示；

(b) ∠*EDB*，答案須準確至三位有效數字；

(c) *AD* 與平面 *EDB* 的交角，答案須準確至三位有效數字。

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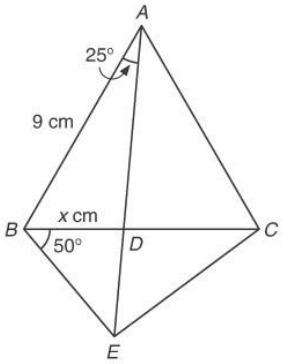
25 In the figure, *ABC* is an equalteral triangle of side 9 cm. *D* is a point on *BC* such that ∠*BAD* = 25°.



(a) **(i)** Let *BD* = *x* cm. By considering △*ABD* and △*ACD*, show that

$$\frac{x}{\sin 25°} = \frac{9-x}{\sin 35°}.$$

(ii) Hence, find *x* correct to 3 decimal places.

(b) *AD* is produced to *E* such that ∠*EBD* = 50°. Find *BE* and *CE* correct to 3 significant figures.

在圖中，*ABC* 是一個邊長為 9 cm 的等邊三角形。*D* 是 *BC* 上的一點，使∠*BAD* = 25°。

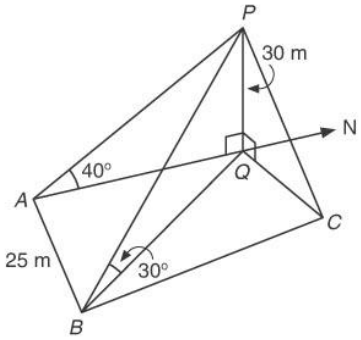
(a) **(i)** 設 *BD* = *x* cm。考慮△*ABD* 和△*ACD*，試證明

$$\frac{x}{\sin 25°} = \frac{9-x}{\sin 35°}$$ 。

(ii) 由此求出 *x* ，答案須準確至三位小數。

(b) *AD* 延長至 *E*，使∠*EBD* = 50°。求 *BE* 和 *CE* ，答案須準確至三位有效數字。

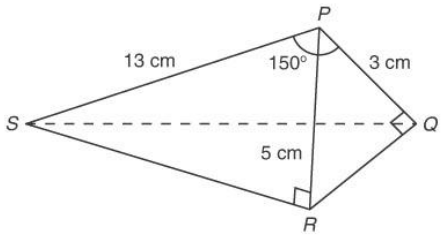
26. In the figure, a pole *PQ* stands vertically on the horizontal ground *ABPQ* and *Q* is due north of *A*. When a man walks from *A* to *B*, the angle of elevation of *P* changes from 40° to 30°. It is given that *PQ* = 30 m and *AB* = 25 m.



(a) Find the true bearing of *B* from *A*.

(b) The man then walks from *B* to *C*. If *A*, *B*, *C* and *Q* are concyclic with *BC* = *QC*, find the angle of elevation of *P* from *C*.
(Give your answer correct to the nearest degree.)

27. In the figure, *PQRS* is a pyramid such that *PQ* = 3 cm, *PR* = 5 cm, *PS* = 13 cm, ∠*QPS* = 150° and ∠*PQR* = ∠*PRS* = 90°.
在圖中，垂直的柱子 *PQ* 位於水平地面 *ABPQ* 上，而 *Q* 則位於 *A* 的正北面。當一名男子從 *A* 步行至 *B*，測得 *P* 的仰角從 40° 變成 30°。已知 *PQ* = 30 m 及 *AB* = 25 m。



(a) Find *SQ*.

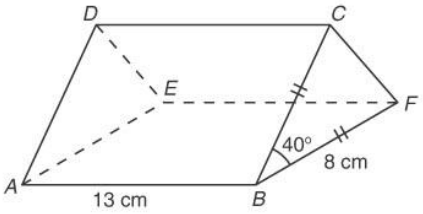
(b) Find the area of △*QRS*.

(c) State with reason whether ∠*PRQ* represents the angle between the planes *PRS* and *QRS*.
(Give your answers correct to 3 significant figures.)

(a) 求由 *A* 測得 *B* 的真方位角。

(b) 該男子從 *B* 步行至 *C*。若 *A*、*B*、*C* 和 *Q* 共圓，且 *BC* = *QC*，求由 *C* 測得 *P* 的仰角。
（答案須準確至最接近的度。）

28. The figure shows a triangular prism. $BC = BF = 8$ cm, $AB = 13$ cm and $\angle CBF = 40°$, find



(a) $\angle CAF$,

(b) the angle between the line CA and the plane $ABFE$.

(Give your answers correct to 3 significant figures if necessary)

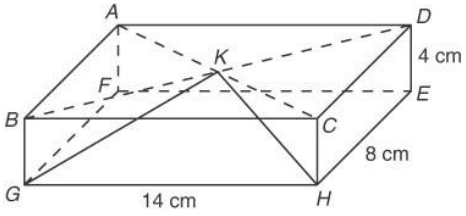
圖中所示為一個三棱柱。其中 $BC = BF = 8$ cm，$AB = 13$ cm 及$\angle CBF = 40°$，求

(a) $\angle CAF$；

(b) CA 與平面 $ABFE$ 的交角。

(如有需要，取答案準確至三位有效數字。)

29. In the figure, $ABCDEFGH$ is a cuboid, where $GH = 14$ cm, $HE = 8$ cm and $DE = 4$ cm. AC intersects BD at K. Find



(a) KG and $\angle GKH$,

(b) the angle between the line KG and the plane $EFGH$,

(c) the angle between the planes KGH and $EFGH$.

(Give your answers correct to 3 significant figure if necessary)

在圖中，$ABCDEFGH$ 是一個長方體，當中 $GH = 14$ cm，$HE = 8$ cm 及 $DE = 4$ cm。AC 與 BD 相交於 K。求

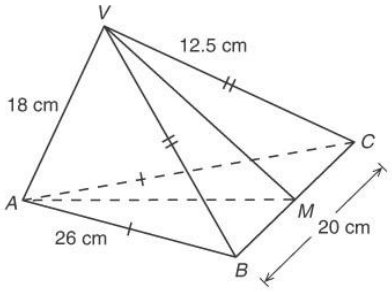
(a) KG 和$\angle GKH$；

(b) KG 與平面 $EFGH$ 的交角；

(c) 平面 KGH 與 $EFGH$ 的交角。

（如有需要，取答案準確至三位有效數字。）

30. The figure shows a tetrahedron *VABC*, where *AB* = *AC* = 26 cm, *VB* = *VC* = 12.5 cm, *VA* = 18 cm and *BC* = 20 cm. *M* is the mid-point of *BC*. Find



(a) *VM* and *AM*,

(b) the angle between the planes *VBC* and *ABC*,

(c) the value of the tetrahedron.

(give your answer correct to 3 significant figures)

圖中所示為一個四面體 *VABC*，其中 *AB* = *AC* = 26 cm，*VB* = *VC* = 12.5 cm，*VA* = 18 cm 及 *BC* = 20 cm。*M* 是 *BC* 的中點。求

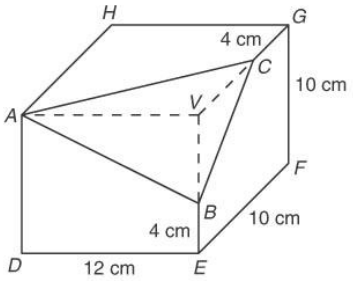
(a) *VM* 和 *AM*；

(b) 平面 *VBC* 和 *ABC* 的交角；

(c) 四面體的體積。

(答案須準確至三位有效數字。)

31. The figure shows a solid which is formed by cutting out the pyramid *VABC* from a cuboid, where *DE* = 12 cm, *EF* = *FG* = 10 cm and *EB* = *CG* = 4 cm. Find



(a) *AC*, *AB* and *BC* and leave the answers in surd form.

(b) the total surface area of the solid.

(c) the angle between the planes *ABC* and *BEFGC* correct to 1 decimal place.

圖中所示為把一個長方體切出一個棱錐 *VABC* 後，所剩下的立體。當中 *DE* = 12 cm，*EF* = *FG* = 10 cm 及 *EB* = *CG* = 4 cm。求

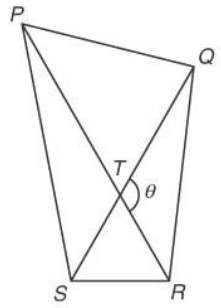
(a) *AC*、*AB* 和 *BC* ，答案以根式表示。

(b) 該立體的表面積。

(c) 平面 *ABC* 和 *BEFGC* 的交角，答案須準確至一位小數。

Level 2+ Questions
程度 2+ 題目

1. In the figure, *PQRS* is a quadrilateral. Diagonals *PR* and *QS* meet at *T* and $\angle QTR = \theta$.
在圖中，*PQRS* 是一個四邊形。對角線 *PR* 和 *QS* 相交於 *T*，而$\angle QTR = \theta$。



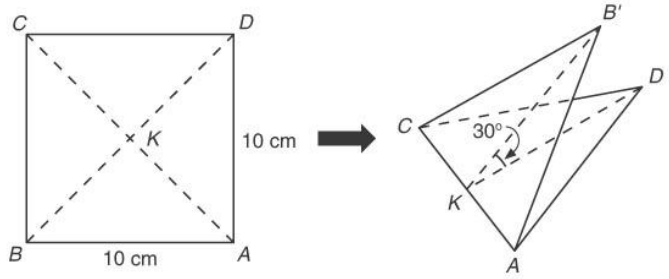
(a) Show that the area of *PQRS* is $\frac{1}{2}(PR)(QS)\sin\theta$.

(b) If *PT* : *TR* = 4 : 1, *QT* : *TS* = 3 : 1 and *RST* is an equilateral triangle of side 10 cm, find the area of *PQRS* in surd form.

(a) 證明 *PQRS* 的面積為$\frac{1}{2}(PR)(QS)\sin\theta$。

(b) 若 *PT* : *TR* = 4 : 1，*QT* : *TS* = 3 : 1 及 *RST* 是一個邊長為 10 cm 的等邊三角形 10 cm。求 *PQRS* 的面積，答案以根式表示。

2 In the figure, *ABCD* is a square of side 10 cm and diagonals *AC* and *BD* meet at *K*. The square is folded along *AC* so that *B* takes up a new position *B*′ and the plane *AB*′*C* is inclined at 30° to the plane *ADC*.
在圖中，*ABCD* 是一個邊長 10 cm 的正方形，而對角線 *AC* 和 *BD* 相交於 *K*。把正方形沿 *AC* 摺疊，使 *B* 到達位置 *B*′，而平面 *AB*′*C* 與平面 *ADC* 成 30°角。求



Find

(a) *B*′*D*,

(b) $\angle B'AD$,

(c) the perpendicular distance of *A* from *B*′*D*,

(d) the angle *AB*′ makes with the plane *ADC*.

(Give your answer correct to 3 significant figures if necessary.)

(a) $B'D$；

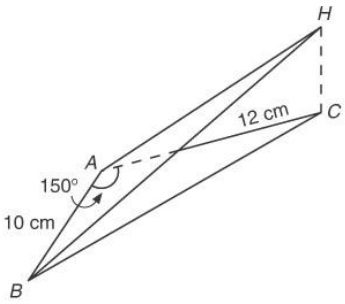
(b) $\angle B'AD$；

(c) A 與 $B'D$ 的垂直距離；

(d) AB' 與平面 ADC 的交角。

(如有需要，取答案準確至三位有效數字。）

3. In the figure, the two triangular cardboards ABC and ABH intersect at AB . The plane ABC is on the ground and H is vertically above C. Given that AB = 10 cm, AC = 12 cm, $HC = 6\sqrt{3}$ cm, $\angle BAC = 150°$ and $\angle BAH$ is obtuse angle, find



(a) the area of $\triangle ABC$,

(b) the angle between planes ABC and ABH.

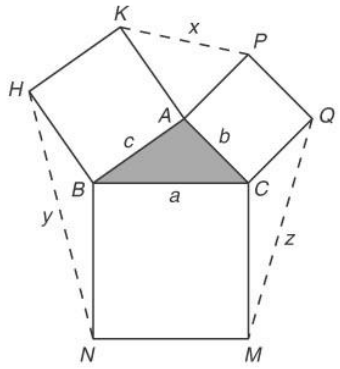
在圖中，兩塊三角紙板 ABC 和 ABH 相交於 AB。平面 ABC 位於地面上，而 H 則位於 C 點的正上方。已知 AB = 10 cm，AC = 12 cm，$HC = 6\sqrt{3}$ cm，$\angle BAC = 150°$ 及$\angle BAH$ 是鈍角，求

(c) $\triangle ABC$ 的面積；

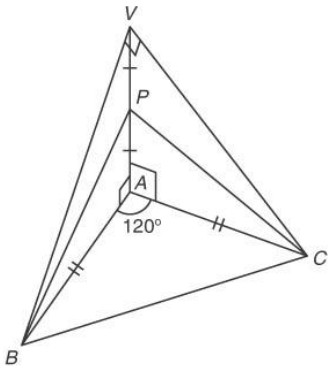
(d) 平面 ABC 和 ABH 的交角。

4. If the figure, ABC is a triangle, $ABHK$, $BCMN$ and $CAPQ$ are squares drawn. If $BC = a$, $CA = b$, $AB = c$, $KP = x$, $HN = y$ and $QM = z$, show that $x^2 + y^2 + z^2 = 3(a^2 + b^2 + c^2)$.

在圖中，ABC 是一個三角形，$ABHK$、$BCMN$ 和 $CAPQ$ 是正方形。若 $BC = a$，$CA = b$，$AB = c$，$KP = x$，$HN = y$ 及 $QM = z$，證明 $x^2 + y^2 + z^2 = 3(a^2 + b^2 + c^2)$。



5. The figure shows a pyramid *VABC* with the base *ABC* lies on the horizontal ground. *V* is vertically above *A* and *P* is the mid-point of *VA*. If $AB = AC = \sqrt{50}$ cm, $\angle BAC = 120°$ and $\angle BVC = 90°$.
圖中所示為一個棱錐 *VABC* ，其底部 *ABC* 位於水平地面上。*V* 位於 *A* 的正上方，而 *P* 則是 *VA* 的中點。若 $AB = AC = \sqrt{50}$ cm ，$\angle BAC = 120°$ 及 $\angle BVC = 90°$，



Find

(a) *VA*.

(b) $\angle BPC$

(c) the angle between the planes *PBC* and *VBC*.

(Give your answers correct to 3 significant figures if necessary.)

求

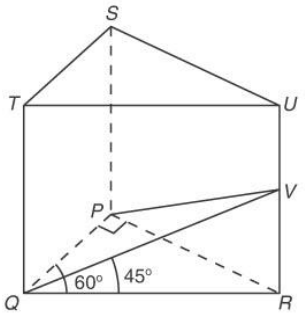
(a) *VA*；

(b) $\angle BPC$；

(c) 平面 *PBC* 與 *VBC* 的交角。

(如有需要，取答案準確至三位有效數字。）

6. In the figure, *PQRSTU* is a right triangular prism with $\angle QPR = 90°$, $\angle PQR = 60°$ and $QR = x$. *V* is a point on the edge *RU* such that the $\angle VQR = 45°$.



(a) Express *QV* and *VR* in terms of *x*.

(b) Find $\angle PVQ$ correct to the nearest degree.

(c) Find the angle between planes *PQV* and *PQR* correct to the nearest degree.

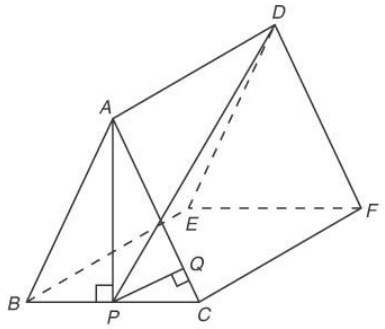
在圖中，*PQRSTU* 是一個直立三棱柱，其中 $\angle QPR = 90°$，$\angle PQR = 60°$ 及 $QR = x$。*V* 是 *RU* 上的一點，使 $\angle VQR = 45°$。

(a) 試以 *x* 表示 *QV* 和 *VR*。

(b) 求 $\angle PVQ$ ，答案須準確至最接近的度。

(c) 求平面 *PQV* 與 *PQR* 的交角，答案須準確至最接近的度。

7. In the figure, *ABCDE* is a triangular prism, where *AB* = 7 cm, *BC* = 10 cm, *AC* = 9 cm and *CF* = 12 cm, *AP* ⊥ *BC* and *PQ* ⊥ *AC* . Find



(a) (i) the area of △*ABC*.

(ii) *AP*,

(b) the angle between the lime *PD* and the plane *AB*,

(c) (i) ∠*PAC* and *PQ*,

(ii) the angle between the line *PD* and the plane *ACFD*.

(Give your answers correct to 3 significant figures)

在圖中， *ABCDE* 是一個三角棱柱，其中 *AB* = 7 cm，*BC* = 10 cm，*AC* = 9 cm 及 *CF* = 12 cm， 而 *AP* ⊥ *BC* 及 *PQ* ⊥ *AC* 。求

(a) (i) △*ABC* 的面積；

(ii) *AP*；

(b) *PD* 與平面 *AB* 的交角；

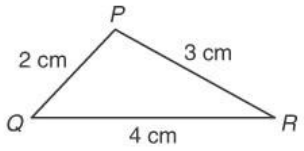
(c) (i) ∠*PAC* 和 *PQ*；

(ii) *PD* 與平面 *ACFD* 的交角。

（答案須準確至三位有效數字。）

Multiple Choice Questions
選擇題

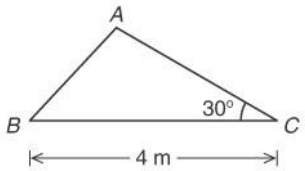
1. Find the area of $\triangle PQR$ in the figure.
求圖中$\triangle PQR$ 的面積。



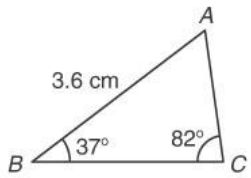
A. 2.90 cm^2 (cor. to 3 sig. fig.)
B. 3.00 cm^2 (cor. to 3 sig. fig.)
C. 8.44 cm^2 (cor. to 3 sig. fig.)
D. 9.00 cm^2 (cor. to 3 sig. fig.)

2. In the figure, the area of $\triangle ABC$ is 3 m^2. AC =
在圖中，$\angle ACB = 30°$ 及 $\triangle ABC$ 的面積為 3 m^2。AC =

A. 4 m.
B. 3 m.
C. 1.5 m.
D. 0.5 m.



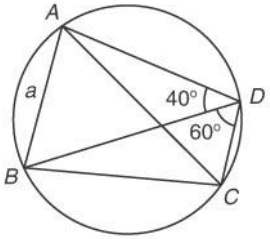
3. Find the area of $\triangle ABC$ in the figure.
求圖中$\triangle ABC$ 的面積。



A. 2.2 cm^2 (cor. to 1 d.p.)
B. 3.0 cm^2 (cor. to 1 d.p.)
C. 3.4 cm^2 (cor. to 1 d.p.)
D. 7.9 cm^2 (cor. to 1 d.p.)

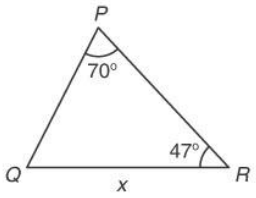
4. In the figure, $\angle ADB = 40°$, $\angle BDC = 60°$ and $AB = a$, then AC =
在圖中，$\angle ADB = 40°$，$\angle BDC = 60°$ 及 $AB = a$。AC =

A. $\dfrac{a \sin 40°}{\sin 60°}$.
B. $\dfrac{a \sin 40°}{\sin 80°}$.
C. $\dfrac{a \sin 60°}{\sin 40°}$.
D. $\dfrac{a \sin 80°}{\sin 40°}$.



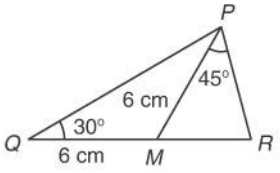
5. In the figure, x =
在圖中，x =

A. $\dfrac{PQ \sin 70°}{\sin 47°}$.
B. $\dfrac{PQ \sin 63°}{\sin 47°}$.
C. $\dfrac{PQ \sin 47°}{\sin 70°}$.
D. $\dfrac{PQ \sin 47°}{\sin 63°}$.



6. In the figure, $PM = QM = 6$ cm, $\angle PQR = 30°$, $\angle MPR = 45°$ and QMR is a straight line. Find PR.

在圖中， $PM = QM = 6$ cm， $\angle PQR = 30°$，$\angle MPR = 45°$ 及 QMR 是一條直線。求 PR。



A. $\dfrac{3\sqrt{3}}{\sin 75°}$ cm

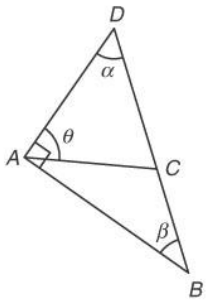
B. $\dfrac{12}{\sqrt{3}\sin 75°}$ cm

C. $3\sqrt{3}\sin 75°$ cm

D. $\dfrac{3\sqrt{2}}{\sin 75°}$ cm

7. In the figure, $\angle A = 90°$ and BDC is a straight line. Find $\dfrac{CD}{BC}$.

在圖中，$\angle A = 90°$ 及 BDC 是一條直線。求 $\dfrac{CD}{BC}$。



A. $\dfrac{\sin\alpha}{\sin\beta\tan\theta}$

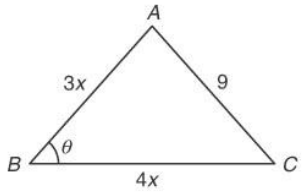
B. $\dfrac{\sin\alpha}{\sin\beta\sin\theta}$

C. $\dfrac{\sin\beta\tan\theta}{\sin\alpha}$

D. $\dfrac{\sin\beta\sin\theta}{\sin\alpha}$

8. In the figure, if $\cos\theta = \dfrac{2}{3}$, find x.

在圖中，若 $\cos\theta = \dfrac{2}{3}$，求 x。



A. 2

B. 3

C. 4

D. 5

9. In the figure, C is the mid-point of BD and $\angle ABD = 90°$. Then, $\sin\theta =$

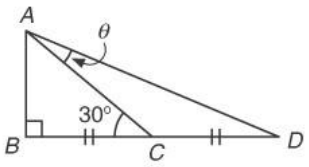
在圖中，C 是 BD 的中點及 $\angle ABD = 90°$。$\sin\theta =$

A. $\dfrac{\sqrt{13}}{23}$.

B. $\dfrac{\sqrt{26}}{13}$.

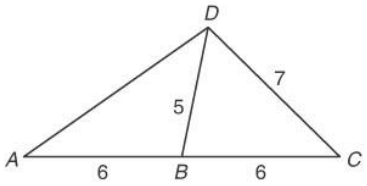
C. $\dfrac{\sqrt{39}}{13}$.

D. $\dfrac{\sqrt{39}}{26}$.



10. In the figure, $AB = BC = 6$ cm, $BD = 5$ cm, $CD = 7$ cm and $\triangle ABC$ is a straight line. Find, to the nearest integer, the area of $\triangle ABD$.

在圖中，$AB = BC = 6$ cm，$BD = 5$ cm，$CD = 7$ cm 及 $\triangle ABC$ 是一條直線。求 $\triangle ABD$ 的面積，答案須準確至最接近的整數。



A. 13 cm^2

B. 14 cm^2

C. 15 cm^2

D. 16 cm^2

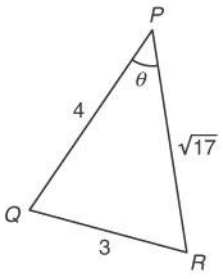
11. In the figure, find the value of sin θ.
在圖中，求 sin θ 的值。

A. $\frac{2\sqrt{34}}{17}$

B. $\frac{2\sqrt{17}}{17}$

C. $\frac{3\sqrt{34}}{17}$

D. $\frac{3\sqrt{17}}{17}$



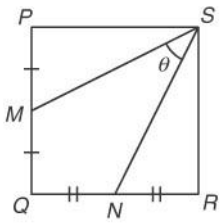
12. In the figure, $PQRS$ is a square. M and N are mid-points of PQ and QR respectively. Then cos θ =
在圖中，$PQRS$ 是一個正方形，而 M 和 N 分別為 PQ 和 QR 的中點，則 cos θ =

A. $\frac{1}{2}$.

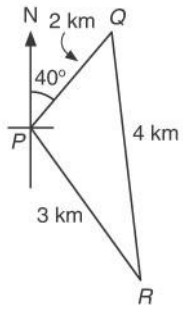
B. $\frac{1}{4}$.

C. $\frac{3}{4}$.

D. $\frac{4}{5}$.



13. In the figure, find the compass bearing of R from P to the nearest degree.
在圖中，求由 P 測得 R 的羅盤方位角，答案須準確至最接近的度。



A. S36°E

B. S54°E

C. S40°E

D. S50°E

14. The compass bearing of A from B is N70°W. Find the compass bearing of B from A.
由 B 測得 A 的羅盤方位角是 N70°W。求由 A 測得 B 的羅盤方位角。

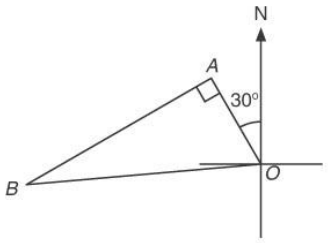
A. N70°W

B. N20°W

C. S70°E

D. S20°E

15. In the figure, the true bearing of A from B is
在圖中，由 B 測得 A 的真方位角是



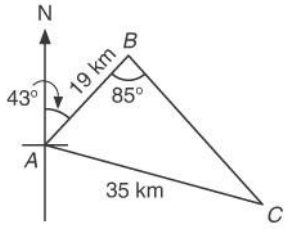
A. 030°.

B. 060°.

C. 150°.

D. 210°.

16. In the figure, the true bearing of C from A is
在圖中，由 A 測得 C 的真方位角是



A. 032.7°. (correct to the nearest 0.1°)

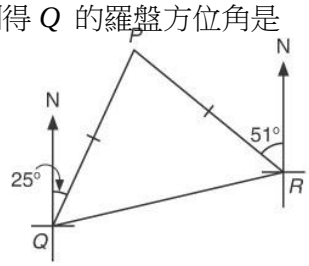
B. 062.3°. (correct to the nearest 0.1°)

C. 105.3°. (correct to the nearest 0.1°)

D. 115.3°. (correct to the nearest 0.1°)

17. In the figure, the compass bearing of Q from R is

在圖中，由 R 測得 Q 的羅盤方位角是



A. S77°W.

B. N77°E.

C. S52°W.

D. N17°E.

18. A building X is 4 km due south of park P and another building Y is 6 km due west of P. Find the compass bearing of X from Y.

大廈 X 位於公園 P 正南方 4 km 處，而另一大廈 Y 則位於 P 正西方 6 km 處。求由 Y 測得 X 的羅盤方位角。

A. S34.7°E (correct to the nearest 0.1°)

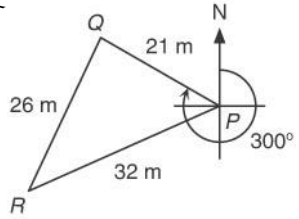
B. S34.7°W (correct to the nearest 0.1°)

C. N56.3°W (correct to the nearest 0.1°)

D. S56.3°E (correct to the nearest 0.1°)

19. In the figure, find the true bearing of R from P to the nearest degree.

在圖中，求由 P 測得 R 的真方位角，答案須準確至最接近的度。



A. 54°

B. 66°

C. 225°

D. 246°

22. In the figure, Q is southeast from P and R is due east of Q. If PQ = 5 km and QR = 8 km, find the distance between P and R correct to the nearest km.

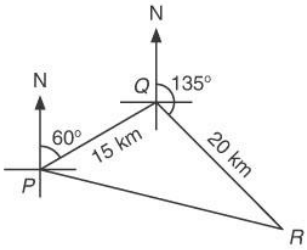
在圖中， Q 位於 P 的東南方，而 R 則位於 Q 的正東方。若 PQ = 5 km 及 QR = 8 km，求 P 與 R 之間的距離，答案須準確至最接近的 km。

A. 13 km

B. 12 km

20. In the figure, the true bearing of Q from P is 060° and that of R from Q is 135°. If PQ = 15 km and QR = 20 km, find the distance between P and R correct to nearest km.

在圖中，由 P 測得 Q 的真方位角是 060° ，而由 Q 測得 R 的方位角則是 135°。若 PQ = 15 km 及 QR = 20 km，求 P 與 R 之間的距離，答案須準確至最接近的 km。



A. 7 km

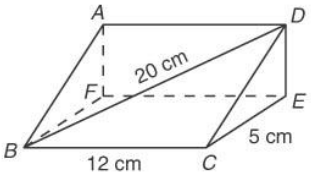
B. 25 km

C. 28 km

D. 32 km

21. In the figure, $ABCDEF$ is a right triangular prism. Find the angle between AB and plane $BCEF$, correct to the nearest degree.

在圖中，$ABCDEF$ 是一個直立三棱柱。求 AB 與平面 $BCEF$ 的交角，答案須準確至最接近的度。



A. 45°

B. 53°

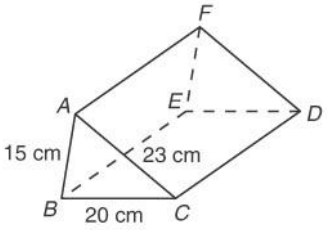
C. 67°

D. 72°

C. 9 km

D. 8 km

23. In the figure, *ABCDEF* is a right triangular prism. Find, correct to the nearest 0.1°, the angle between planes *ABEF* and *ACDF*.
在圖中，*ABCDEF* 是一個正三棱柱。求平面 *ABEF* 與 *ACDF* 的交角，答案須準確至最接近的 0.1°。



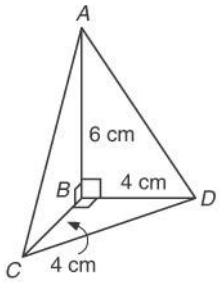
A. 40.1°

B. 59.1°

C. 80.8°

D. 90.0°

24. In the figure, *ABC* is a tetrahedron, $\angle ABC = \angle ABD = \angle CBD = 90°$, $AB = 6$ cm and $BC = BD = 4$ cm. Find, correct to the nearest degree, the angle between planes *ACD* and *BCD*.
在圖中，*ABC* 是一個四面體，$\angle ABC = \angle ABD = \angle CBD = 90°$，$AB = 6$ cm 及 $BC = BD = 4$ cm。求平面 *ACD* 與 *BCD* 的交角，答案須準確至最接近的度。



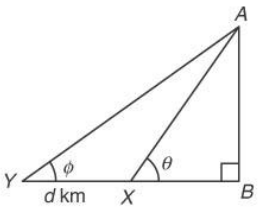
A. 65°

B. 56°

C. 45°

D. 35°

25. In the figure, *BXY* is a straight line, *X* and *Y* are *d* km apart. The angle of elevation from *C* and *D* to the top of the building *AB* are θ and ϕ respectively. Find the height of the building.
在圖中，*BXY* 是一條直線， *X* 和 *Y* 相距 *d* km。由 *C* 和 *D* 測得大廈 *AB* 頂部的仰角分別為 θ 和 ϕ 。求大廈 *AB* 的高度。



A. $\dfrac{d\sin(\theta-\phi)}{\sin\theta\sin\phi}$ km

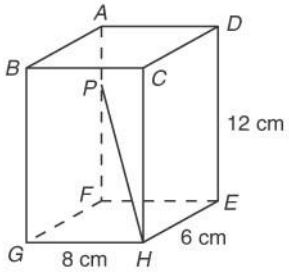
B. $\dfrac{d\sin\theta\sin\phi}{\sin(\theta-\phi)}$ km

C. $\dfrac{d\cos\theta\sin\phi}{\sin(\theta-\phi)}$ km

D. $\dfrac{d\sin\theta\cos\phi}{\sin(\theta-\phi)}$ km

26. In the figure, *ABCDEFGH* is a cuboid. *P* is a

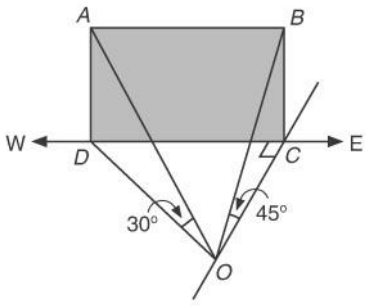
point on AF such that $AP : PF = 1 : 2$. Find the angle between PH and plane $ABGF$, correct to the nearest degree.
在圖中，$ABCDEFGH$ 是一個長方體。P 是位於 AF 上的一點，使 $AP : PF = 1 : 2$。求 PH 與平面 $ABGF$ 的交角，答案須準確至最接近的度。



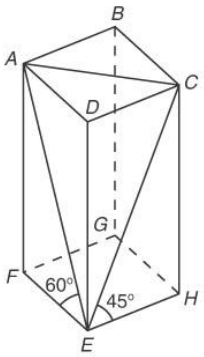
A. 39°
B. 51°
C. 59°
D. 63°

27. In the figure, $ABCD$ is a vertical rectangular wall with CD lies in east-west direction. O is due south of C. If the angle of elevation A and B from O are 30° and 45° respectively, then $\sin \angle DOC =$
在圖中，$ABCD$ 是一道長方形的牆，其中 CD 向着東西方向。O 位於 C 的正南方。若由 O 測得 A 和 B 的仰角分別為 30° 和 45°，則 $\sin \angle DOC =$

A. $\frac{\sqrt{2}}{2}$.
B. $\frac{\sqrt{3}}{2}$.
C. $\frac{\sqrt{6}}{3}$.
D. $\frac{2\sqrt{3}}{3}$



28. In the figure, $ABCDEFGH$ is a rectangular block, where $\angle AEF = 60°$ and $\angle CEH = 45°$. Find $\cos \angle AEC$.
在圖中， $ABCDEFGH$ 是一個長方體形木塊，其中$\angle AEF = 60°$ 及$\angle CEH = 45°$。求 $\cos \angle AEC$。



A. $\frac{\sqrt{2}}{6}$
B. $\frac{\sqrt{3}}{6}$
C. $\frac{\sqrt{6}}{4}$
D. $\frac{\sqrt{6}}{3}$