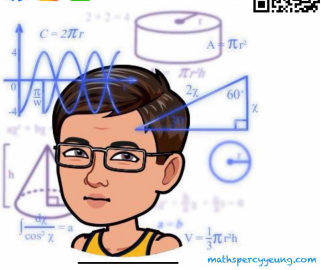
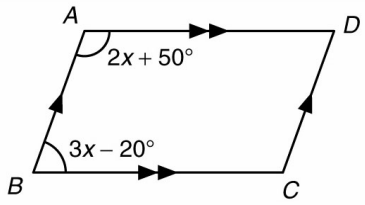


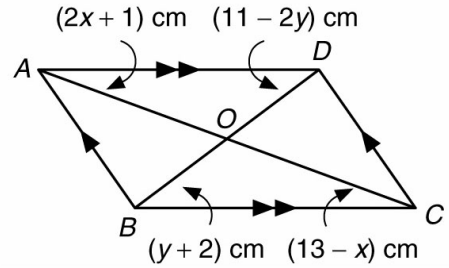
In the figure, $ABCD$ is a parallelogram.



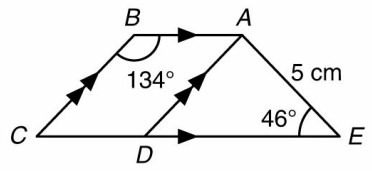
(a) Find x.

(b) Find $\angle C$ and $\angle D$.

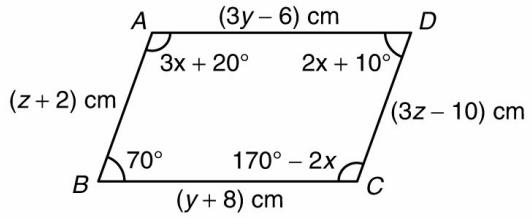
Find the unknowns x and y in the figure.



In the figure, *ABCD* is a parallelogram and *CDE* is a straight line. Find the length of *BC*.



The figure shows a quadrilateral *ABCD*.

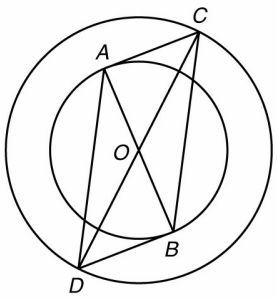


(a) Find the value of *x*.

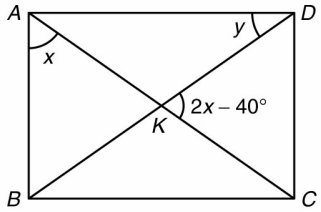
(b) Prove that *ABCD* is a parallelogram.

(c) Hence, find the values of *y* and *z*.

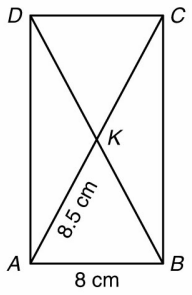
The figure shows two circles with common centre O. AOB and COD are diameters of the inner circle and outer circle respectively. Prove that $ADBC$ is a parallelogram.



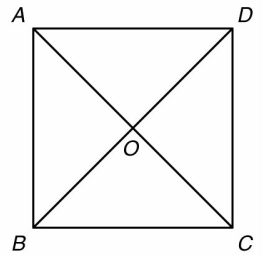
In the figure, $ABCD$ is a rectangle. Find the values of x and y.



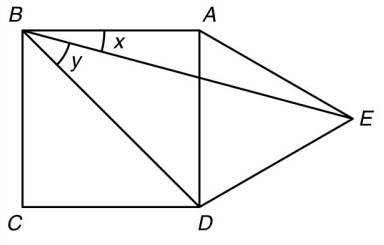
In the figure, $ABCD$ is a rectangle. The diagonals AC and BD intersect at K. If $AB = 8$ cm and $AK = 8.5$ cm, find the length of AD.



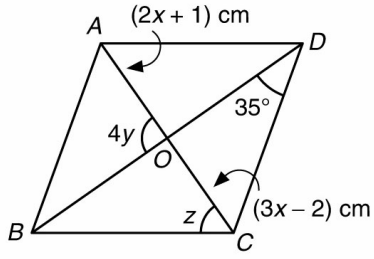
In the figure, $ABCD$ is a square. The diagonals AC and BD intersect at O and the area of $\triangle ABO$ is 50 cm^2. Find AB. (Leave your answer in surd form.)



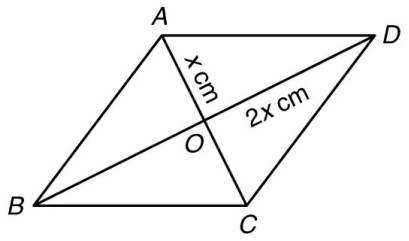
In the figure, *ABCD* is a square and $\triangle ADE$ is an equilateral triangle. Find the values of x and y.



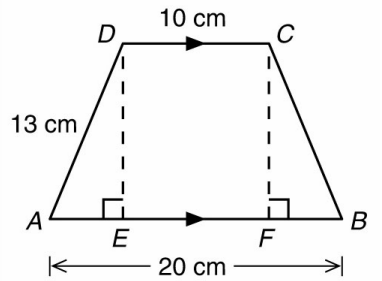
In the figure, *ABCD* is a rhombus. Find the unknowns in the figure.



In the figure, $ABCD$ is a rhombus of area 72 cm^2. The diagonals AC and BD intersect at O, where $AO = x$ cm and $OD = 2x$ cm. Find the length of AD. (Leave your answer in surd form.)



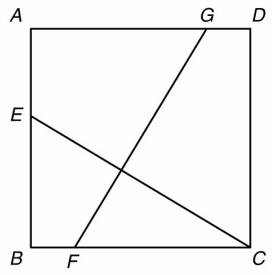
The figure shows an isosceles trapezium $ABCD$, where DC // AB. Both DE and CF are perpendicular to AB. Given that DC = 10 cm, AB = 20 cm and AD = 13 cm,



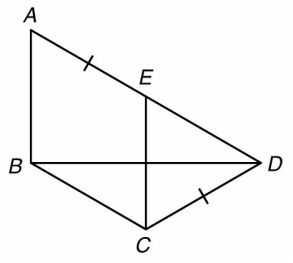
(a) find the height (DE) of the isosceles trapezium,

(b) find the area of the isosceles trapezium.

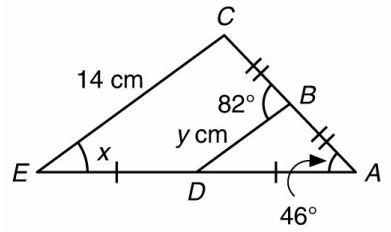
In the figure, $ABCD$ is a square. Two line segments of equal length, CE and FG, are drawn inside the square. Prove that $\angle BCE = 90° - \angle AGF$.



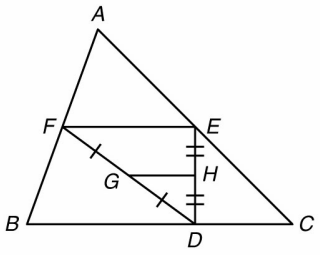
In the figure, $ABCE$ is a rhombus. If AED is a straight line and $AE = CD$, prove that $\angle BAD = 2\angle ADB$.



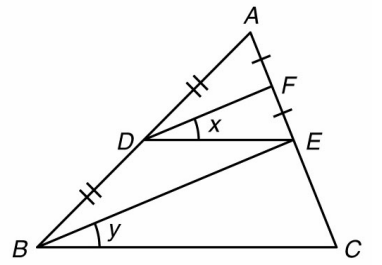
The figure shows $\triangle ACE$. B and D are the mid-points of AC and AE respectively. Find the values of x and y.



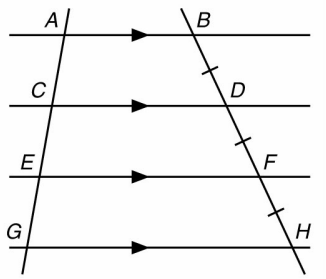
The figure shows $\triangle ABC$ and $\triangle DEF$. E and F are the mid-points of AC and AB respectively, while G and H are the mid-points of DF and DE respectively. If $BC = 14$ cm, find the length of GH.



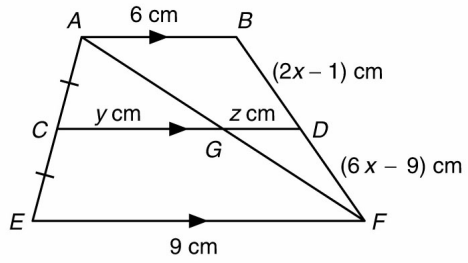
In the figure, $AF = FE = \frac{1}{2} EC$ and $AD = DB$. Prove that $x = y$.



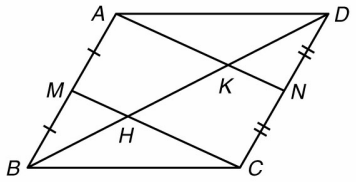
In the figure, $BD = DF = FH$ and $AB // CD // EF // GH$. If $AG = 10$ cm, find the length of AE.



In the figure, $AC = CE$ and $AB // CD // EF$. Find the values of x, y and z.



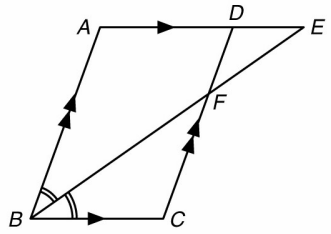
In the figure, $ABCD$ is a parallelogram. M and N are the mid-points of AB and DC respectively.



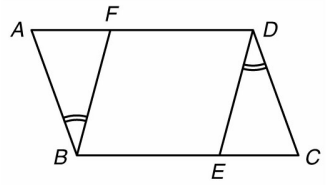
(a) Prove that $AMCN$ is a parallelogram.

(b) Prove that $BH = HK = KD$.

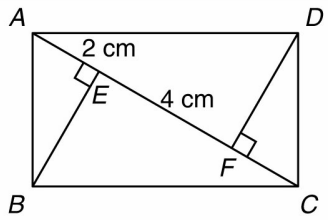
In the figure, *ABCD* is a parallelogram. *EFB* is the angle bisector of $\angle ABC$. Prove that $AE = DC$.



In the figure, *ABCD* is a parallelogram. $\angle ABF = \angle EDC$. Prove that *BEDF* is a parallelogram.



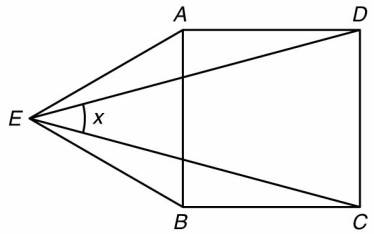
In the figure, $ABCD$ is a rectangle. E and F are two points on the diagonal AC, such that $BE \perp AC$ and $DF \perp AC$. Given that $AE = 2$ cm and $EF = 4$ cm, find the lengths of



(a) FC,

(b) AB.

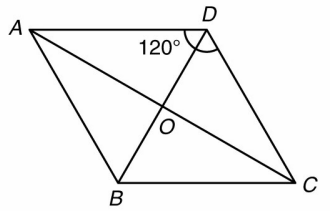
In the figure, $ABCD$ is a square and $\triangle AEB$ is an equilateral triangle.



(a) Prove that $\triangle AED \cong \triangle BEC$.

(b) Find the value of x.

The figure shows a rhombus $ABCD$, where $\angle D = 120°$ and $BD = 8$ cm.



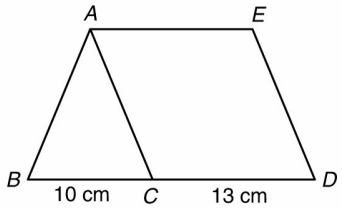
(a) Find the length of a side of the rhombus.

(b) Find the length of the diagonal AC.

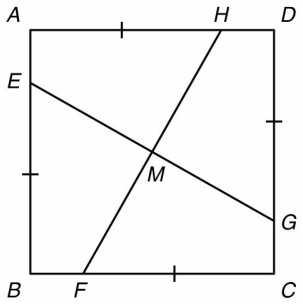
(c) Find the area of the rhombus.

(Leave your answer in surd form if necessary.)

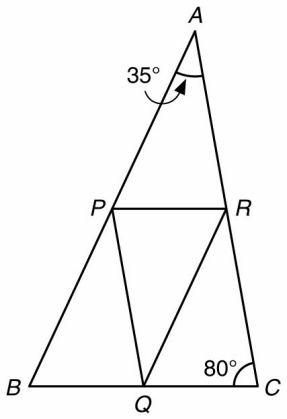
In the figure, *ABDE* is an isosceles trapezium and *ACDE* is a rhombus. If *BC* = 10 cm and *CD* = 13 cm, find the area of trapezium *ABDE*.



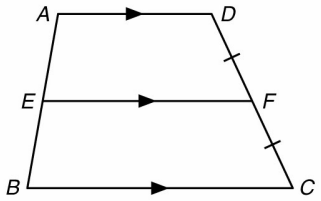
The figure shows a square $ABCD$. E, F, G and H are points on AB, BC, CD and DA respectively, where $EB = FC = GD = HA$. If EG and FH intersect at M, prove that $\angle HMG = 90°$.

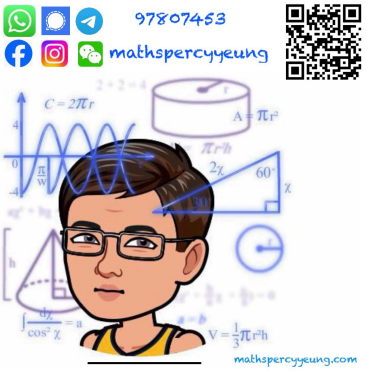


The figure shows $\triangle ABC$, where $\angle A = 35°$ and $\angle C = 80°$. If P, Q and R are the mid-points of AB, BC and CA respectively, find $\angle PRQ$.

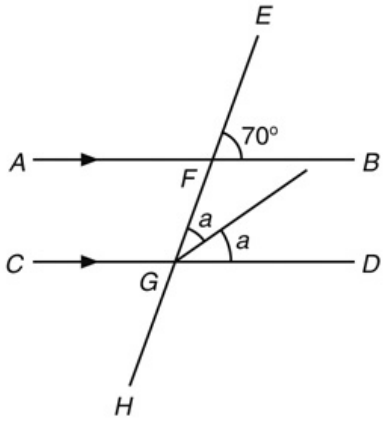


In the figure, $ABCD$ is a trapezium. AD // EF // BC and $DF = FC$. Prove that $EF = \frac{1}{2}(AD + BC)$.

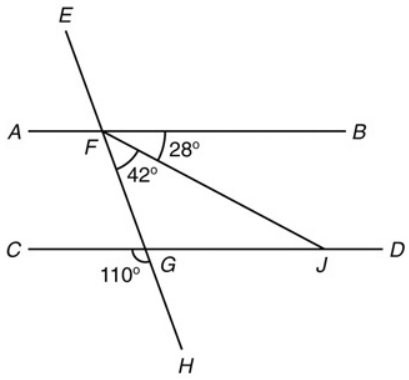




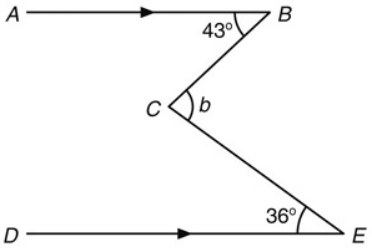
In the figure, find a.



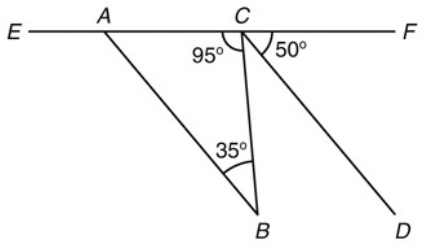
In the figure, AFB, CGD and $EFGH$ are straight lines. If $\angle BFJ = 28°$, $\angle JFG = 42°$ and $\angle CGH = 110°$, prove that $AB \parallel CD$.



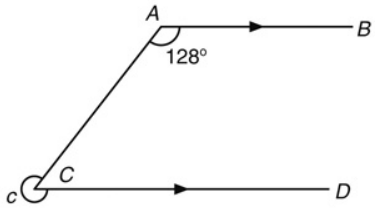
In the figure, find b.



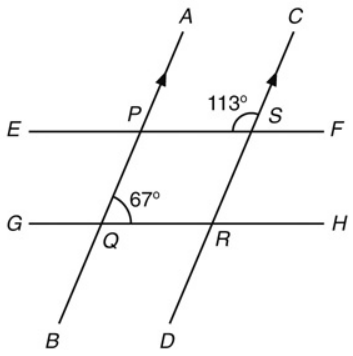
In the figure, *EACF* is a straight line. If $\angle ABC = 35°$, $\angle ACB = 95°$ and $\angle DCF = 50°$, prove that *AB* // *CD*.



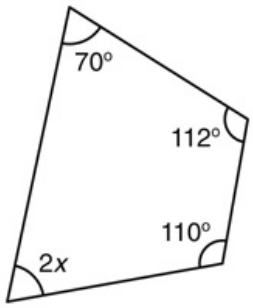
In the figure, find *c*.



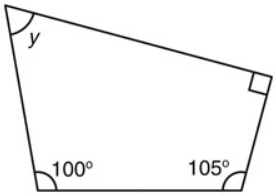
In the figure, *APQB*, *CSRD*, *EPSF* and *GQRH* are straight lines. If *BA* // *DC*, $\angle PQR = 67°$ and $\angle PSC = 113°$, prove that *EF* // *GH*.



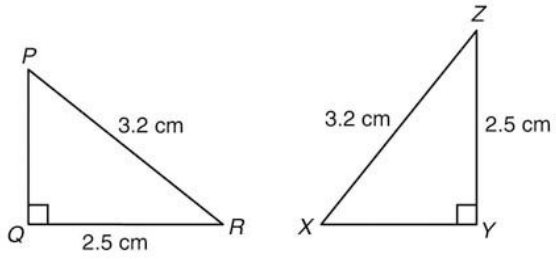
In the figure, find *x*.



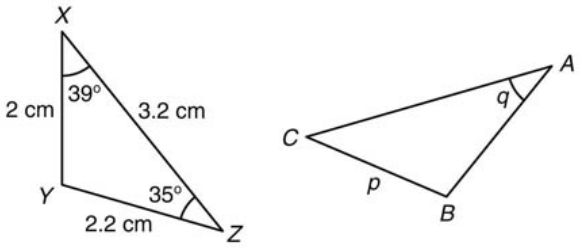
In the figure, find y.



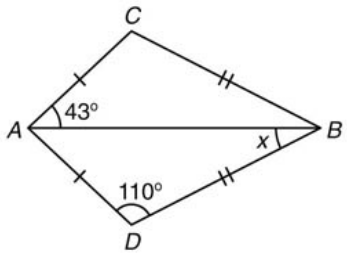
In the figure, what is the reason for $\triangle PQR \cong \triangle XYZ$?

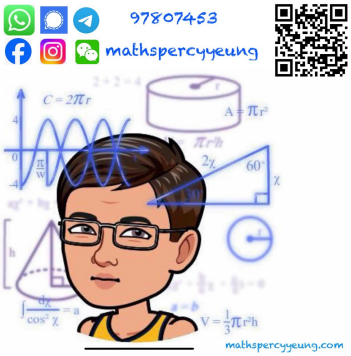


In the figure, $\triangle XYZ \cong \triangle CBA$, find p and q.

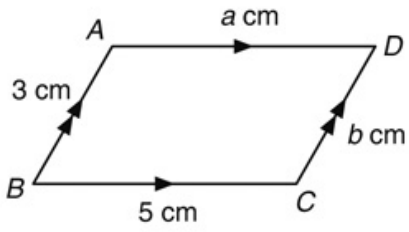


In the figure, find x.

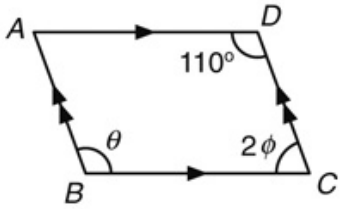




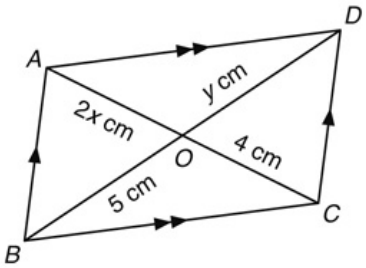
Find the unknowns in parallelogram *ABCD*.



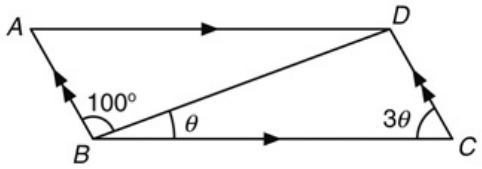
Find the unknowns in parallelogram *ABCD*.



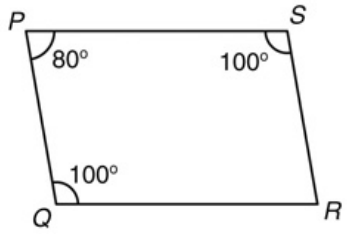
Find the unknowns in parallelogram *ABCD*.



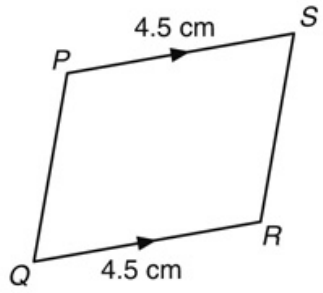
Find the unknown in parallelogram *ABCD*.



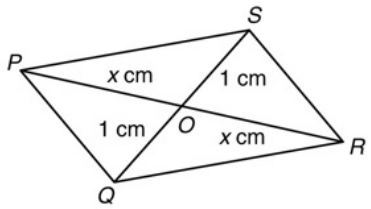
Prove that *PQRS* is a parallelogram.



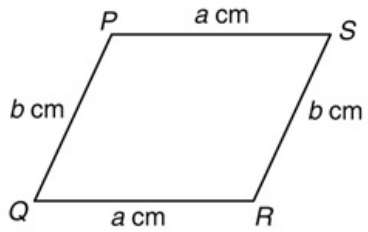
Prove that *PQRS* is a parallelogram.



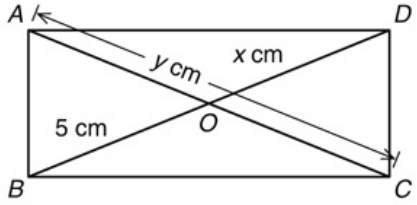
Prove that *PQRS* is a parallelogram.



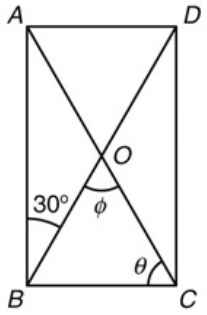
Prove that *PQRS* is a parallelogram.



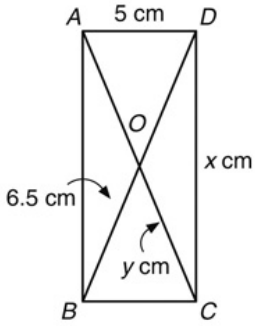
Find the unknowns in rectangle *ABCD*.



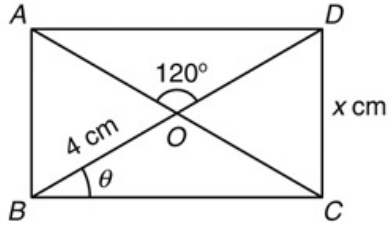
Find the unknowns in rectangle *ABCD*.



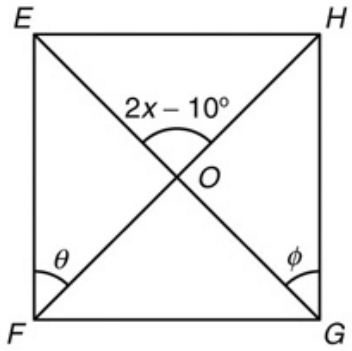
Find the unknowns in rectangle *ABCD*.



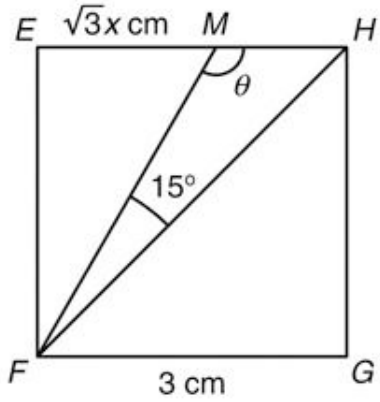
Find the unknowns in rectangle *ABCD*.



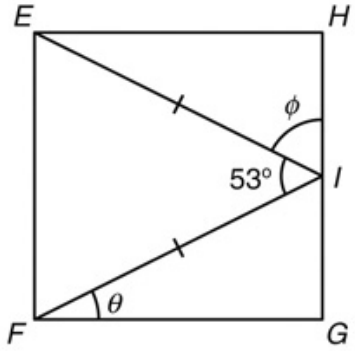
Find the unknowns in square *EFGH*.



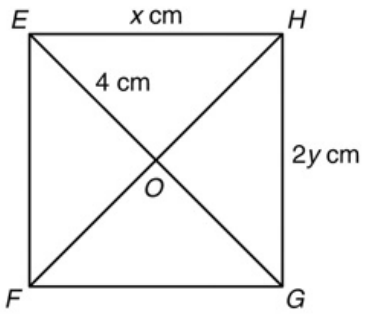
Find the unknowns in square *EFGH*.



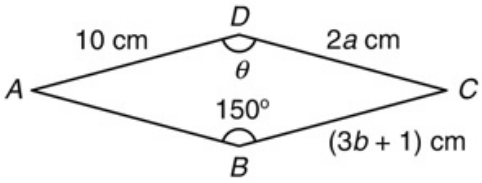
Find the unknowns in square *EFGH*.



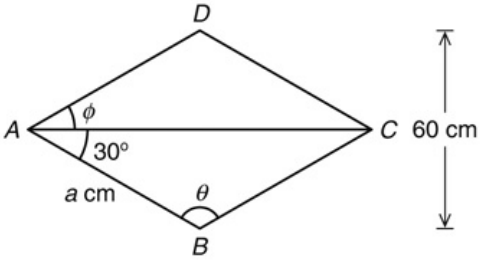
Find the unknowns in square *EFGH*.



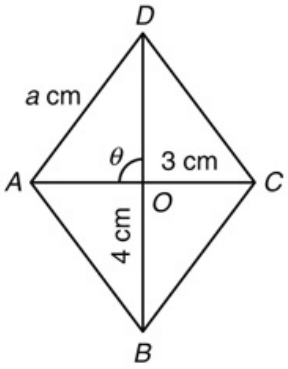
Find the unknowns in rhombus *ABCD*.



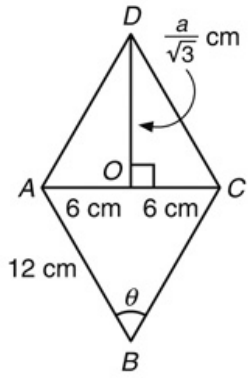
Find the unknowns in rhombus *ABCD*.



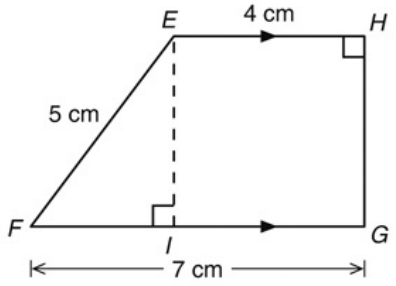
Find the unknowns in rhombus *ABCD*.



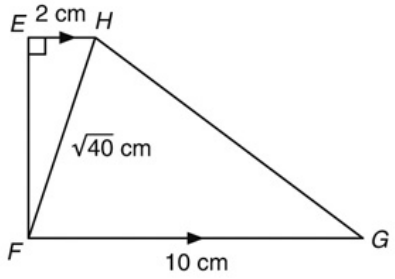
Find the unknowns in rhombus *ABCD*.



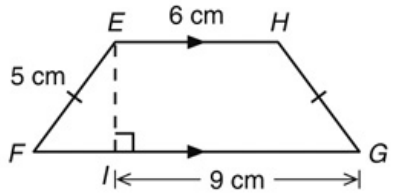
Find the area of trapezium *EFGH*.



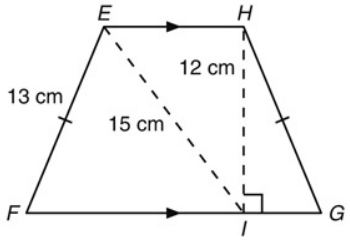
Find the area of trapezium *EFGH*.



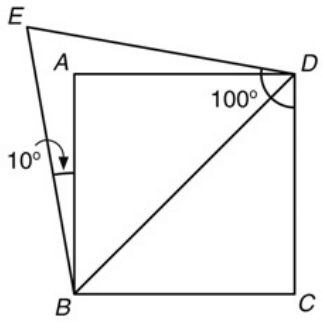
Find the area of trapezium *EFGH*.



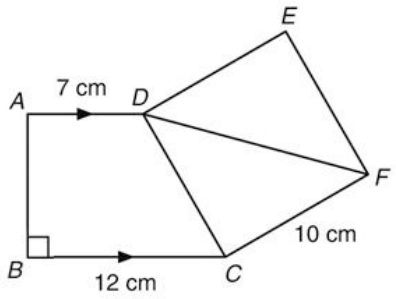
Find the area of trapezium *EFGH*.



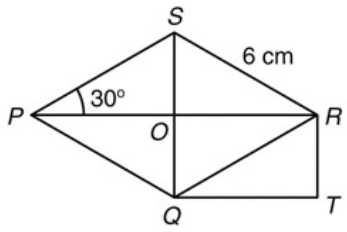
In the figure, $ABCD$ is a square. If $\angle EDC = 100°$ and $\angle EBA = 10°$, find $\angle BED$.



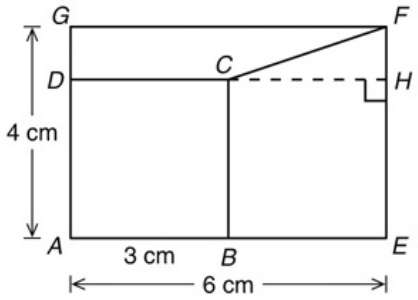
In the figure, $ABCD$ is a trapezium and $CDEF$ is a square. If $CF = 10$ cm, $AD = 7$ cm, $BC = 12$ cm and $\angle B = 90°$, find $\angle BCF$.



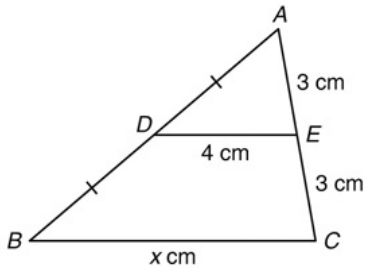
In the figure, *PQRS* is a rhombus and *OQTR* is a rectangle. If *SR* = 6 cm and ∠*SPO* = 30°, find ∠*QRT* and *RT*.



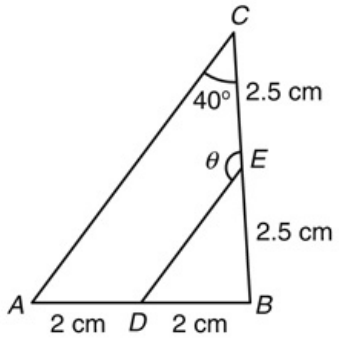
In the figure, *ABCD* is a square and *AEFG* is a rectangle. If *AB* = 3 cm, *AE* = 6 cm and *AG* = 4 cm, find ∠*FCB* correct to the nearest degree.



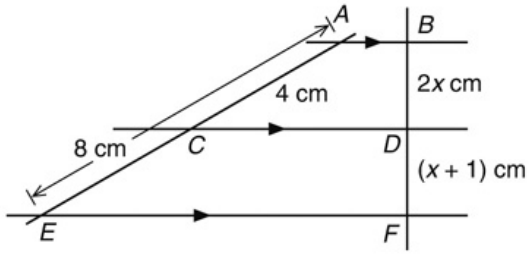
In the figure, find the value of x.



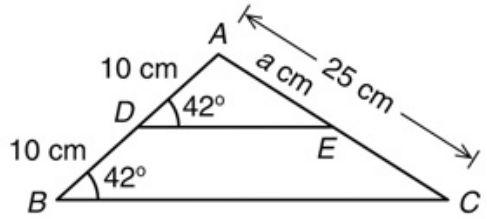
In the figure, find θ.



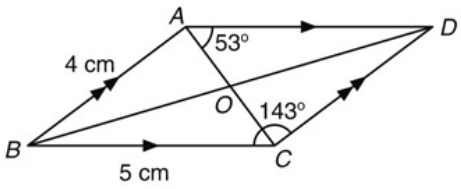
In the figure, find the value of x.

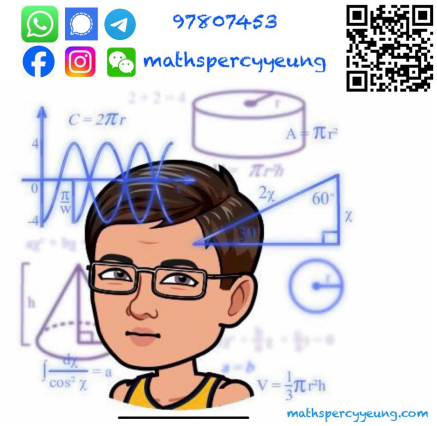


In the figure, find the value of a.

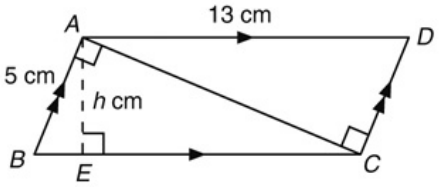


In the figure, $ABCD$ is a parallelogram, $AB = 4$ cm, $BC = 5$ cm, $\angle BCD = 143°$ and $\angle CAD = 53°$. Find AO.

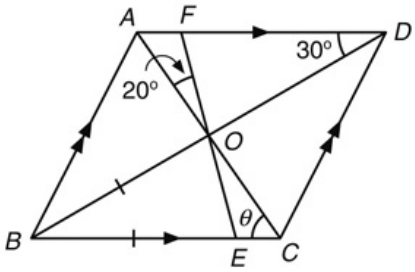




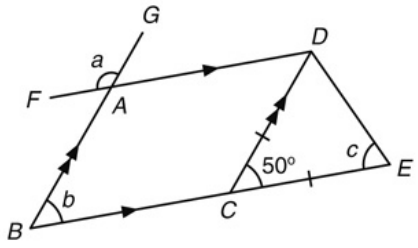
In the figure, $ABCD$ is a parallelogram, $AB = 5$ cm, $AD = 13$ cm, $\angle BAC = \angle ACD = 90°$. Find the value of h correct to 3 significant figures.



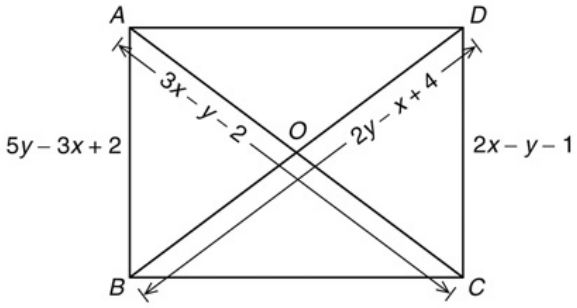
In the figure, $ABCD$ is a parallelogram. If $\angle AOF = 20°$, $\angle ADB = 30°$ and $BO = BE$, find θ.



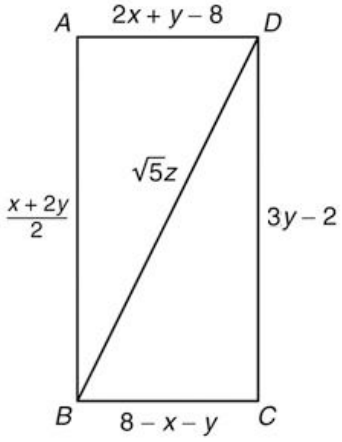
In the figure, *ABCD* is a parallelogram. *BCE*, *BAG* and *FAD* are straight lines. If $\angle DCE = 50°$ and $CD = CE$, find $a + b + c$.



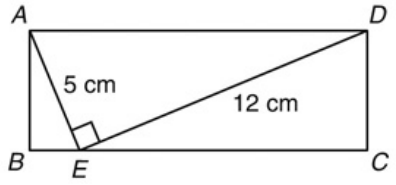
Find the unknowns in rectangle *ABCD*.



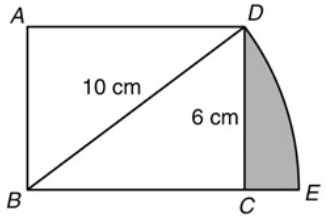
Find the unknowns in rectangle *ABCD*.



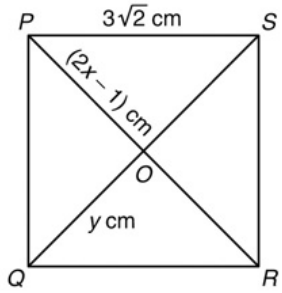
In the figure, *ABCD* is a rectangle. If *AE* = 5 cm, *DE* = 12 cm and $\angle AED = 90°$, find *BE* correct to 3 significant figures.



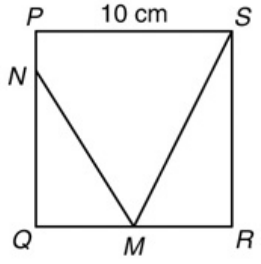
In the figure, $ABCD$ is a rectangle and BED is a sector. If $BD = 10$ cm and $CD = 6$ cm, find the area of the shaded region. (Give your answer correct to 3 significant figures.)



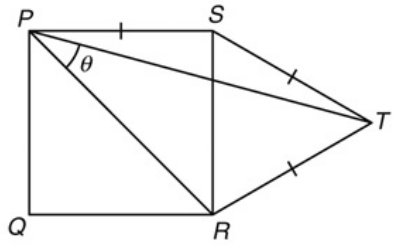
In the figure, $PQRS$ is a square. $PS = 3\sqrt{2}$ cm, $OP = (2x - 1)$ cm and $OQ = y$ cm. Find the values of x and y.



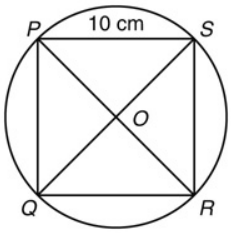
In the figure, $PQRS$ is a square. M is the mid-point of QR. If $PS = 10$ cm and $PN : NQ = 1 : 4$, find $\angle NMS$ correct to the nearest 0.01°.



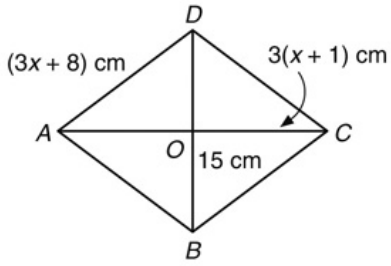
In the figure, $PQRS$ is a square and $TS = TR = PS$. Find θ.



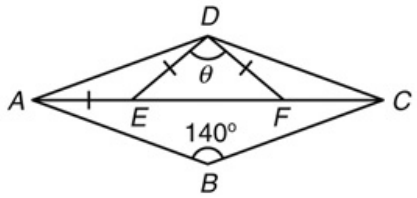
In the figure, $PQRS$ is a square inscribed in a circle with centre O. If $PS = 10$ cm, find the area of the circle. (Leave your answer in terms of π.)



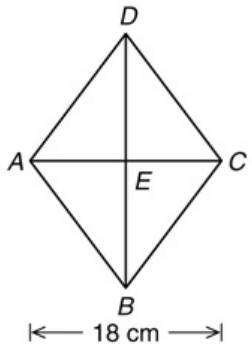
In the figure, $ABCD$ is a rhombus. If $AD = (3x + 8)$ cm, $OB = 15$ cm and $OC = 3(x + 1)$ cm, find the value of x. (Leave your answer in fraction.)



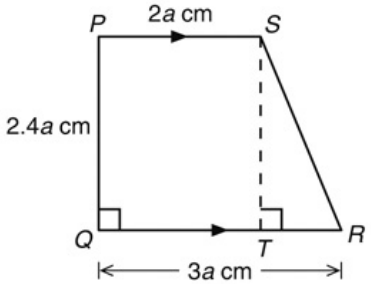
In the figure, $ABCD$ is a rhombus. If $\angle ABC = 140°$ and $AE = DE = DF$, find θ.



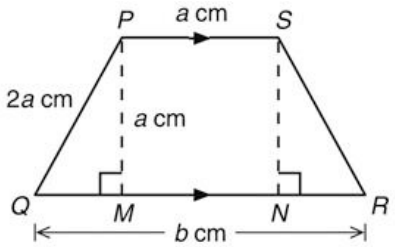
In the figure, $ABCD$ is a rhombus of perimeter 60 cm. If $AC = 18$ cm, find the area of $ABCD$.



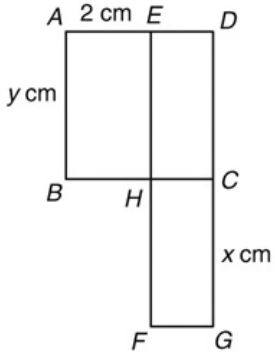
In the figure, $PQRS$ is a right-angled trapezium, where PS // QR. If $PS = 2a$ cm, $PQ = 2.4a$ cm, $QR = 3a$ cm and the area of $PQRS$ is 54 cm^2, find the value of a and $\angle SRQ$ correct to the nearest degree.



In the figure, $PQRS$ is an isosceles trapezium, where PS // QR. If $PS = PM = a$ cm, $QR = b$ cm and $PQ = 2a$ cm, express b in terms of a. (Leave your answer in surd form.)



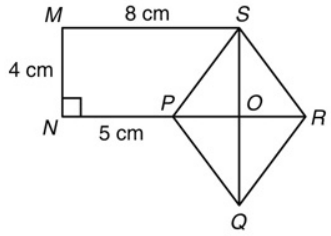
In the figure, $ABCD$ is a square with side y cm and $DEFG$ is a rectangle. $CG = x$ cm and $AE = 2$ cm.



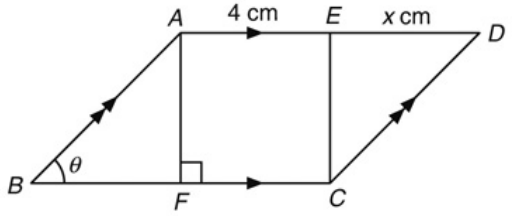
(a) If the perimeters of $ABCD$ and $DEFG$ are the same, find the value of x.

(b) Furthermore, if the area of $ABCD$ is 1.5 times that of $DEFG$, find the value of y. (Leave your answer in surd form.)

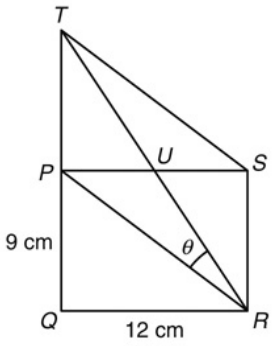
In the figure, $PQRS$ is a rhombus and $MNOS$ is a rectangle. If $MS = 8$ cm, $MN = 4$ cm and $NP = 5$ cm, find the area and the perimeter of the right-angled trapezium $MNRS$.



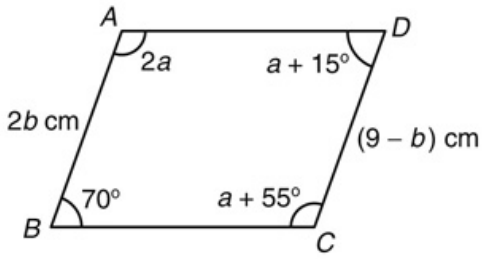
In the figure, *ABCD* is a parallelogram and *AFCE* is a square of side 4 cm. Given that $ED = x$ cm and the area of *ABCD* is twice that of *AFCE*, find x and θ.



In the figure, *PQRS* is a rectangle, *PRST* is a parallelogram and *TPQ* is a straight line. If $PQ = 9$ cm and $QR = 12$ cm, find θ correct to 3 significant figures.



The figure shows a quadrilateral $ABCD$.

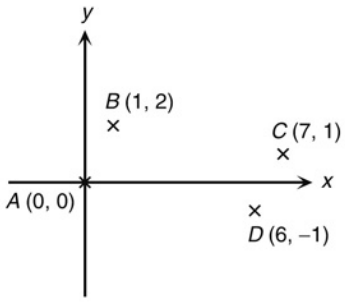


(a) Find a.

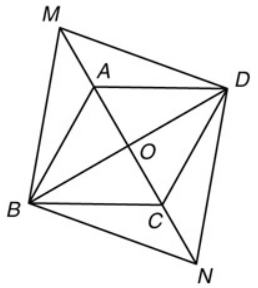
(b) Prove that $ABCD$ is a parallelogram.

(c) Hence, find b.

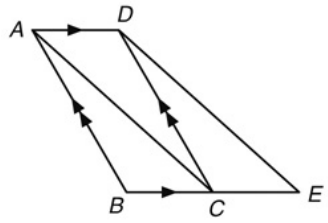
The figure shows four points $A(0, 0)$, $B(1, 2)$, $C(7, 1)$ and $D(6, -1)$. Prove that $ABCD$ is a parallelogram.



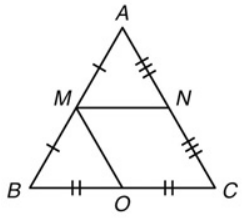
In the figure, *ABCD* is a parallelogram. *MAOCN* is a straight line such that *MA* : *CN* = 1 : 1. Prove that *BNDM* is a parallelogram.



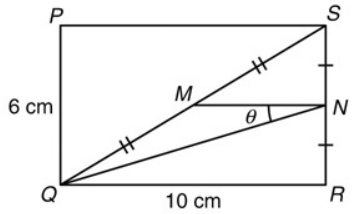
In the figure, *ABCD* is a parallelogram. *BCE* is a straight line and *C* is the mid-point of *BE*. Prove that *ACED* is a parallelogram.



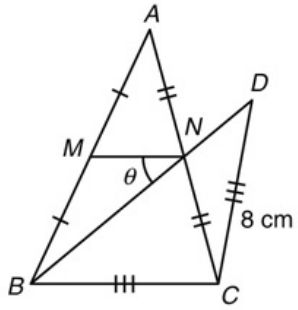
The figure shows $\triangle ABC$. *M*, *O* and *N* are the mid-points of *AB*, *BC* and *AC* respectively. Prove that *MOCN* is a parallelogram.



The figure shows a rectangle $PQRS$. If $QM = MS$, $RN = NS$, $PQ = 6$ cm and $QR = 10$ cm, find θ correct to 3 significant figures.



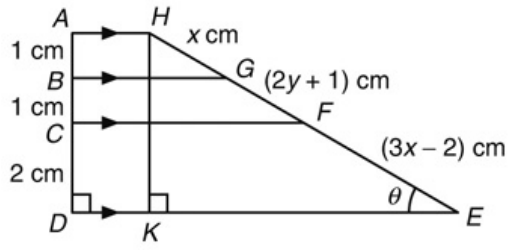
In the figure, M and N are the mid-points of AB and AC respectively. $CD = 8$ cm, $CB = CD$ and BND is a straight line.



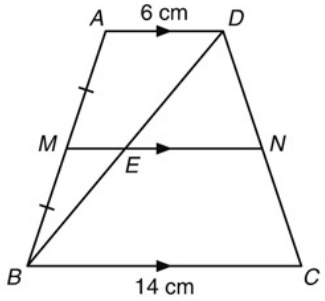
(a) Find MN.

(b) If $\angle MNB = \theta$, express $\angle BCD$ in terms of θ.

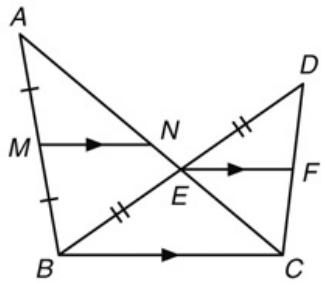
Find the unknowns in the figure.



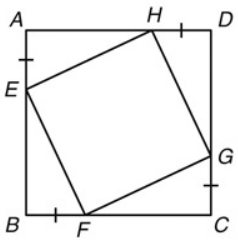
In the figure, AD // MN // BC, $AM = MB$, $AD = 6$ cm, $BC = 14$ cm and BED is a straight line. Find $ME : EN$.

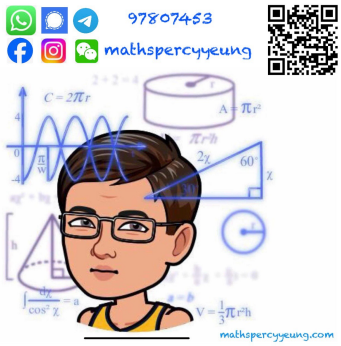


In the figure, $AM = MB$, $DE = EB$, MN // BC and EF // BC. Prove that $MN = EF$.

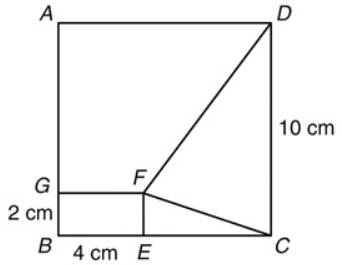


In the figure, *ABCD* is a square. *E*, *F*, *G* and *H* are points on *AB*, *BC*, *CD* and *DA* respectively and *AE* = *BF* = *CG* = *DH*. Prove that *EFGH* is also a square.





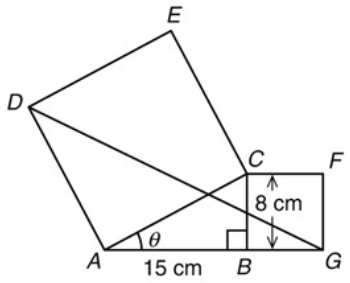
In the figure, $ABCD$ is a square of side 10 cm and $BEFG$ is a rectangle with $BE = 4$ cm and $BG = 2$ cm.



(a) Prove that $\triangle DFC$ is an isosceles triangle.

(b) Find $\angle FDC$ correct to 3 significant figures.

In the figure, ABC is a right-angled triangle, where $AB = 15$ cm, $BC = 8$ cm and $\angle BAC = \theta$.
$DACE$ and $CBGF$ are two squares.

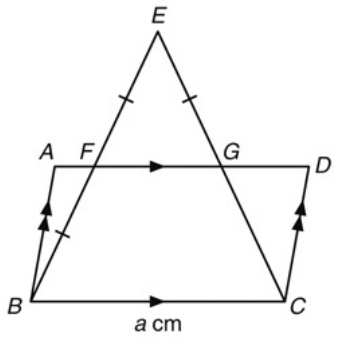


(a) Find θ.

(b) Find the area of $\triangle DAG$.

(Give your answers correct to 3 significant figures.)

In the figure, $ABCD$ is a parallelogram with $BC = a$ cm. BCE is a triangle, where BE and CE cut AD at F and G respectively and $EF = FB = EG$.

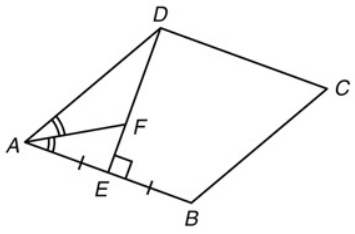


(a) Prove that G bisects CE.

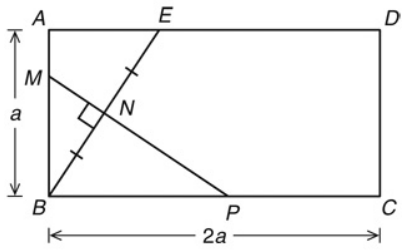
(b) Prove that $BCGF$ is an isosceles trapezium.

(c) Find the ratio of the area of parallelogram $ABCD$ to that of trapezium $BCGF$.

In the figure, $ABCD$ is a rhombus and DE is the perpendicular bisector of AB. F is a point on DE such that AF bisects $\angle DAE$. Find $DF : FE$.



In the figure, $ABCD$ is a rectangle with $AB = a$ and $BC = 2a$. E is a point on AD such that $AE : ED = 1 : 2$. The perpendicular bisector of BE cuts AB, BE and BC at M, N and P respectively.

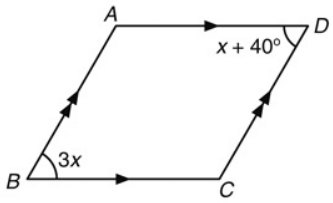


(a) By considering $\triangle BMN$ and $\triangle BEA$, express MN in terms of a.

(b) By considering $\triangle BMN$ and $\triangle PMB$, express PM in terms of a.

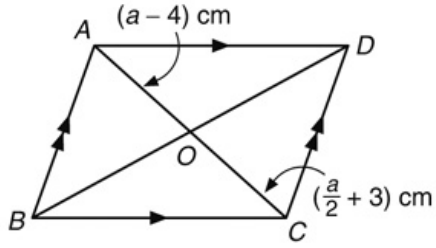
(c) Hence, prove that $\dfrac{MN}{NP} = \dfrac{4}{9}$.

In the figure, $ABCD$ is a parallelogram. Find x.



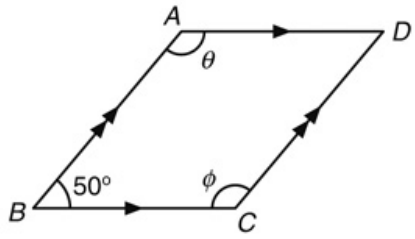
A. 10°
B. 20°
C. 30°
D. 40°

In the figure, $ABCD$ is a parallelogram. Find the value of a.



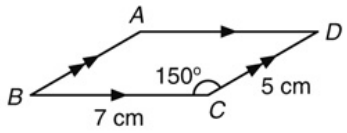
A. 14
B. 16
C. 18
D. 20

In the figure, $ABCD$ is a parallelogram. Find $\theta + \phi$.



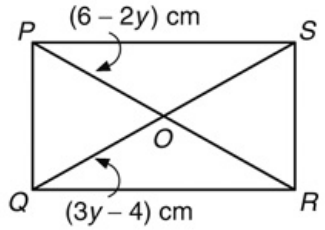
A. 130°
B. 180°
C. 260°
D. 325°

In the figure, *ABCD* is a parallelogram. Find the area of *ABCD*.



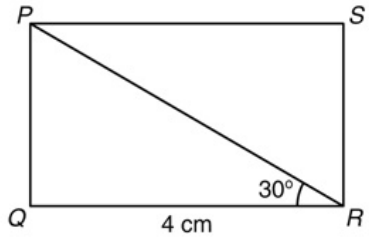
A. $15.5\ \text{cm}^2$
B. $16.5\ \text{cm}^2$
C. $17.5\ \text{cm}^2$
D. $18.5\ \text{cm}^2$

In the figure, *PQRS* is a rectangle. Find the value of y.



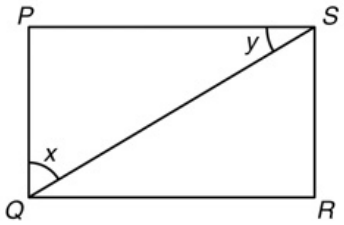
A. 2
B. 3
C. 4
D. 5

In the figure, *PQRS* is a rectangle. Find the area of *PQRS*.



A. $8\sqrt{3}\ \text{cm}^2$
B. $16\sqrt{3}\ \text{cm}^2$
C. $\frac{16\sqrt{3}}{3}\ \text{cm}^2$
D. $\frac{32\sqrt{3}}{3}\ \text{cm}^2$

In the figure, *PQRS* is a rectangle. Find $x + y$.



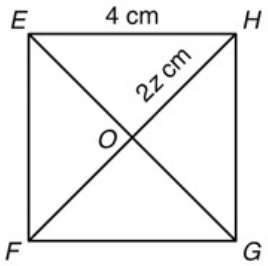
A. 30°
B. 60°
C. 90°
D. 120°

Which of the following is/are properties of a rectangle?

I. All the interior angles are right angles.
II. Diagonals are perpendicular to each other.
III. Diagonals bisect each other into four equal parts.

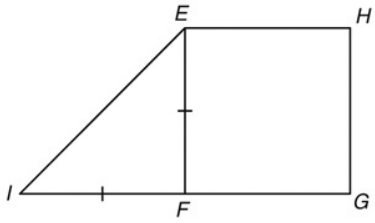
A. I only
B. I and II only
C. I and III only
D. I, II and III

In the figure, *EFGH* is a square. Find the value of *z*.



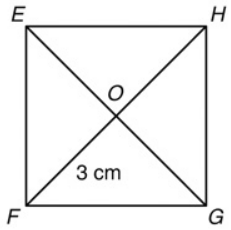
A. 1
B. $\sqrt{2}$
C. $\sqrt{3}$
D. 2

In the figure, *EFGH* is a square. $FI = FE$ and *IFG* is a straight line. Find $\angle HEI$.



A. 135°
B. 165°
C. 195°
D. 225°

In the figure, *EFGH* is a square. Find the area of *EFGH*.



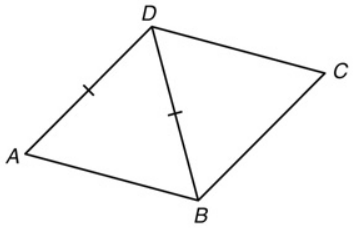
A. 3 cm^2
B. 6 cm^2
C. 12 cm^2
D. 18 cm^2

Which of the following is/are properties of a square?

I. All sides are equal in length.
II. Diagonals are perpendicular to each other.
III. Angle between each diagonal and a side is 45°.

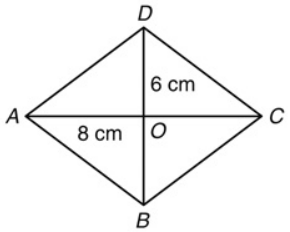
A. I only
B. II only
C. I and III only
D. I, II and III

In the figure, $ABCD$ is a rhombus and $AD = DB$. Find $\angle ADC$.



A. 60°
B. 80°
C. 100°
D. 120°

In the figure, $ABCD$ is a rhombus, where $OA = 8$ cm and $OD = 6$ cm. Find the area of $ABCD$.



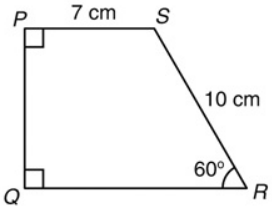
A. 48 cm^2
B. 64 cm^2
C. 80 cm^2
D. 96 cm^2

Which of the following is/are properties of a rhombus?

I. All sides are equal in length.
II. Interior angles are bisected by the diagonals.
III. Diagonals are equal in length.

A. I only
B. II only
C. I and II only
D. I, II and III

In the figure, *PQRS* is a right-angled trapezium. Find the area of *PQRS*.



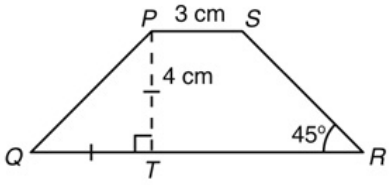
A. $46\sqrt{3}\,\text{cm}^2$

B. $\frac{95\sqrt{3}}{2}\,\text{cm}^2$

C. $50\sqrt{3}\ \text{cm}^2$

D. $\frac{103\sqrt{2}}{2}\,\text{cm}^2$

In the figure, *PQRS* is a trapezium of height 4 cm. Find the perimeter of *PQRS*.



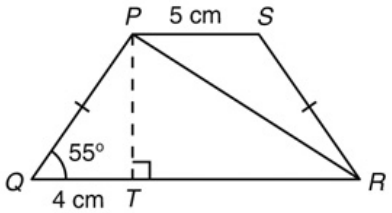
A. $(14+8\sqrt{2})\,\text{cm}$

B. $(14+10\sqrt{2})\,\text{cm}$

C. $(14+12\sqrt{2})\,\text{cm}$

D. $(14+14\sqrt{2})\,\text{cm}$

In the figure, *PQRS* is an isosceles trapezium. Find $\angle PRS$ correct to 3 significant figures.



A. 11.5°

B. 16.6°

C. 22.6°

D. 31.5°

Which of the following is/are properties of a trapezium?

I. It is a quadrilateral with only one pair of parallel opposite sides.

II. The area of a trapezium is the square of its height.

III. Diagonals are perpendicular to each other.

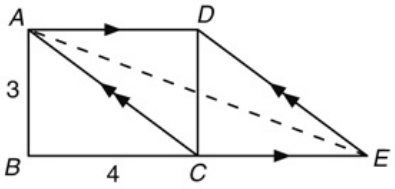
A. I only

B. III only

C. I and III only

D. I, II and III

In the figure, $ABCD$ is a rectangle with $AB = 3$ and $BC = 4$. $ACED$ is a parallelogram. Find $\angle AED$ correct to 3 significant figures.



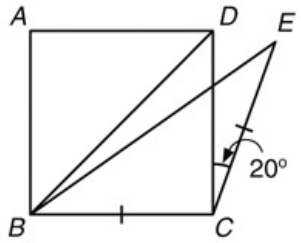
A. 16.3°

B. 17.3°

C. 18.3°

D. 19.3°

In the figure, $ABCD$ is a square. $CB = CE$ and $\angle DCE = 20°$. Find $\angle DBE$.



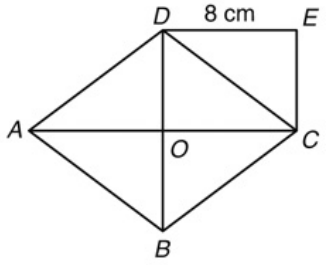
A. 5°

B. 10°

C. 15°

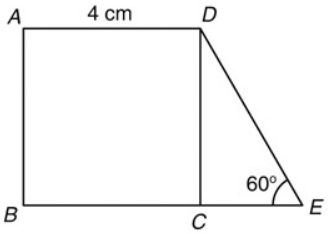
D. 20°

In the figure, $ABCD$ is a rhombus and $DOCE$ is a rectangle with $DE = 8\,\text{cm}$. If the perimeter of $DOCE$ is 28 cm, then the perimeter of $ABCD$ is



A. 24 cm. **B.** 30 cm. **C.** 36 cm. **D.** 40 cm.

In the figure, $ABCD$ is a square of side 4 cm and $ABED$ is a right-angled trapezium with $\angle E = 60°$. Find the ratio of the area of $ABCD$ to that of $ABED$.



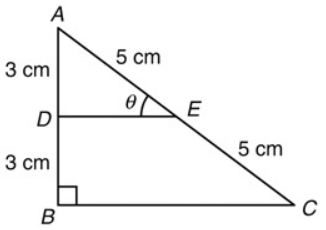
A. $1:\left(4+\frac{1}{\sqrt{3}}\right)$

B. $2:\left(4+\frac{1}{\sqrt{3}}\right)$

C. $1:\left(2+\frac{1}{\sqrt{3}}\right)$

D. $2:\left(2+\frac{1}{\sqrt{3}}\right)$

In the figure, find θ correct to 3 significant figures.



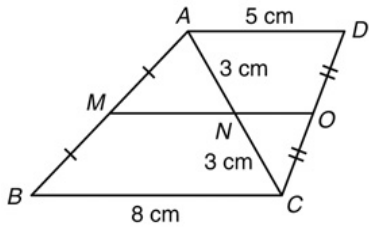
A. 31.0°

B. 36.9°

C. 53.1°

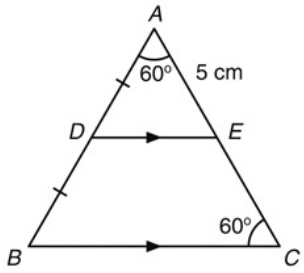
D. 63.2°

In the figure, find MO.



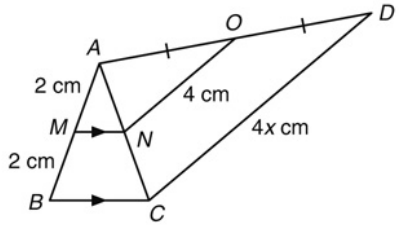
A. 6.5 cm **B.** 7 cm **C.** 7.5 cm **D.** 8 cm

In the figure, find the perimeter of $\triangle ABC$.



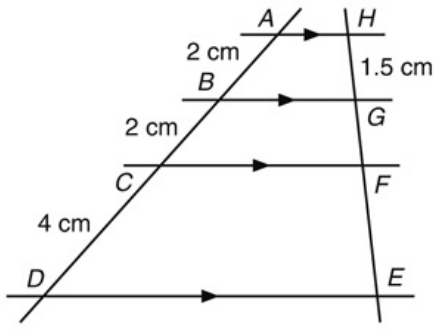
A. 15 cm **B.** 20 cm **C.** 30 cm **D.** 35 cm

In the figure, find x.



A. 1 **B.** 2 **C.** 3 **D.** 4

In the figure, find HE.



A. 4 cm **B.** 5 cm **C.** 6 cm **D.** 7 cm