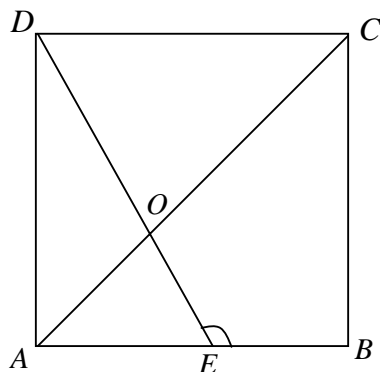


Revision Paper 12: Congruency, Similarity and Circle Properties

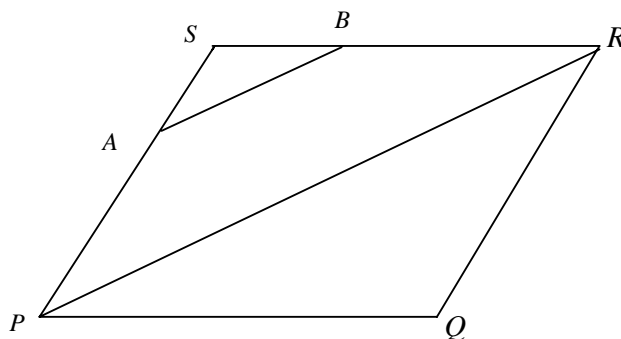
- Q1 $ABCD$ is a square. DE intersects AC at O and angle $OEB = 120^\circ$.
 (a) Name a pair of similar triangles, giving reasons.
 (b) Given that $AO = 2$ cm, $CO = 7$ cm and $DE = 7$ cm, find the length of OE .



- Q2 Two cups are geometrically similar in shape. The height of the smaller cup is 10 cm and the height of the larger cup is 25 cm.
 (a) Find the ratio between the total surface area of the two cups.
 (b) The smaller cup is filled with syrup and sold at \$0.80 per cup. Adam wishes to buy the larger cup with syrup. How much will it cost him?

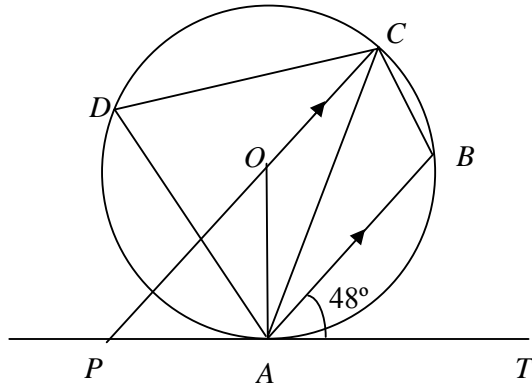


- Q3 $PQRS$ is a parallelogram as shown below. Given that $BR = 3 SB$ and $SA = \frac{1}{4} SP$.



- (a) Show that $\triangle SAB$ is similar to $\triangle SPR$,
 (b) Given that $SA = 2$ cm and $PR = 9$ cm, find the length of AB ,
 (b) Find the ratio $\frac{\text{Area of } \triangle SAB}{\text{Area of parallelogram } PQRS}$

Q4



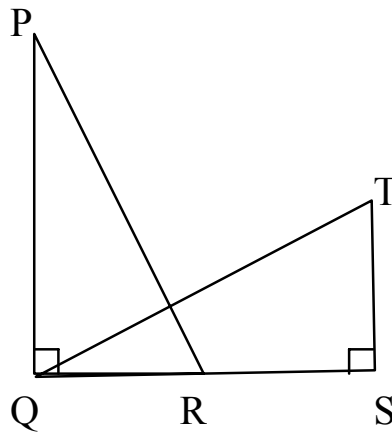
In the diagram, O is the centre of the circle, PAT is the tangent to the circle at A , AB is parallel to OC , $\angle BAT = 48^\circ$ and AC bisects the angle OAB .

Calculate, stating the reasons clearly

- (i) $\angle OCB$,
- (ii) $\angle ADC$,
- (iii) $\angle ABC$,
- (iv) $\angle CPA$.

Q5 In the diagram, $PQ = QS$, $QR = ST$ and $\angle PQR = \angle TSQ = 90^\circ$

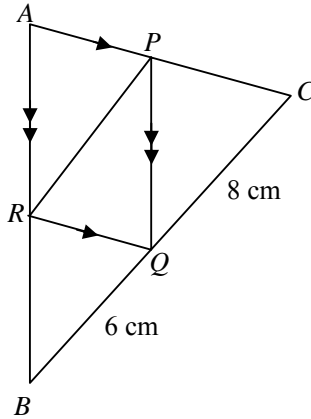
- (i) Name two congruent triangles and prove the case of congruency.
- (ii) If $\angle TQS = 37^\circ$, find $\angle PRQ$.



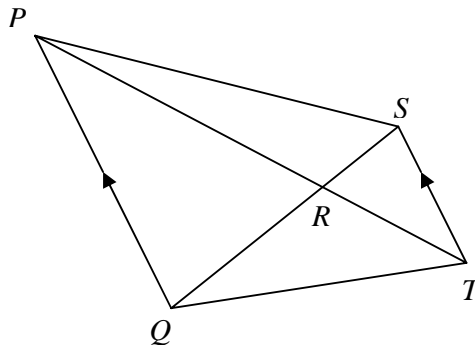
Q6 Alex bought two cylindrical cans of baked beans from the supermarket. The cans are geometrically similar to each other. The height of the small can is $\frac{9}{15}$ the height of the large can

- (i) Find the ratio of the radii of the bases of the cylinders,
- (ii) If the volume of the small can is 270cm^3 , find the volume of the large can.

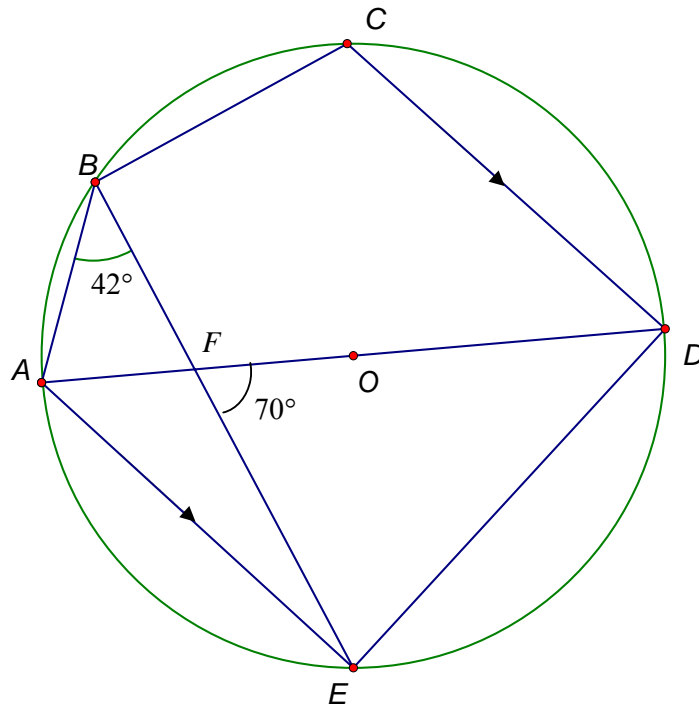
- Q7 In the diagram below, ΔPQR is inscribed into ΔABC such that $APQR$ is a parallelogram. $BQ = 6$ cm and $QC = 8$ cm.



- (a) Show that $\Delta PQR \cong \Delta RAP$.
- (b) Stating your reasons clearly, explain why ΔRQB is similar to ΔPCQ .
- (c) Find the value of
- $\frac{PQ}{AB}$,
 - $\frac{\text{area of } \Delta PQC}{\text{area of } \Delta ABC}$,
 - $\frac{\text{area of } \Delta PQR}{\text{area of } \Delta RAP}$.
- (d) If the area of ΔPQC is 40 cm^2 , calculate the area of the parallelogram $APQR$.
- (e) What is the special name given to the quadrilateral $ABQP$?
- Q8 $PQTS$ is a trapezium with TS parallel to QP . The diagonals PT and QS intersect at R .
- Write down a triangle similar to ΔPRQ and prove the case of similarity
 - Give reasons why the 2 triangles are similar.



- Q9 A, B, C, D and E are points on the circumference of a circle with centre O . The lines AD and BE meet at F . Angle $ABE = 42^\circ$, angle $EFD = 70^\circ$ and AE is parallel to CD .



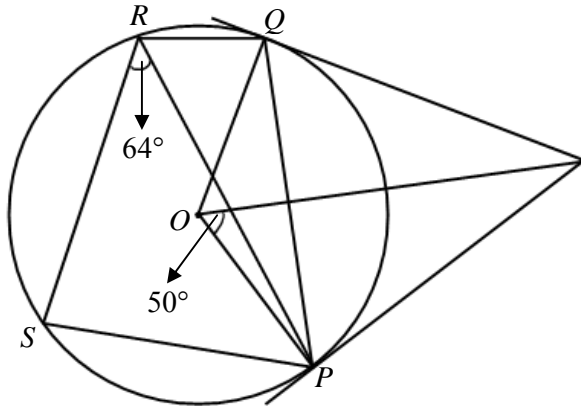
Stating your reasons clearly, find

- (i) angle AEB .
- (ii) angle ABC .

- Q10 (a) In the diagram, the points P, Q, R and S lie on a circle with centre O . The tangents to the circle at P and Q meet at T . $\hat{POT} = 50^\circ$ and $\hat{PRS} = 64^\circ$.

Find, stating your reasons clearly,

- (i) \hat{POQ} ,
- (ii) \hat{PRQ} ,
- (iii) \hat{SPQ} ,
- (iv) \hat{SPO} ,
- (v) \hat{PTQ} .



- (b) Explain why O, P and T lie on another circle with diameter OT .