

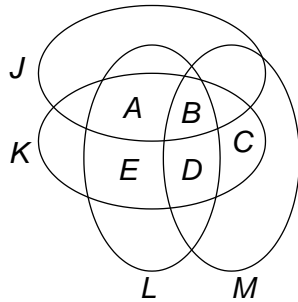
Angles (Intermediate UKMT)

These questions must be attempted **without a calculator**

Topics covered in the questions below may not necessarily be from the topic of the title.

1. J is the set of High Court judges; K is the set of living things beginning with K ; L is the set of all living creatures; M is the set of brilliant mathematicians. Kevin is a very ordinary kangaroo.

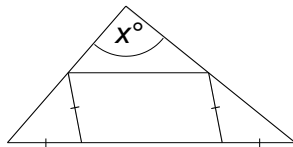
In which of the five regions A-E of the diagram does Kevin belong?



A B C D E

2. The diagram, which is not drawn accurately, shows a parallelogram inside a triangle. The marked lengths are equal.

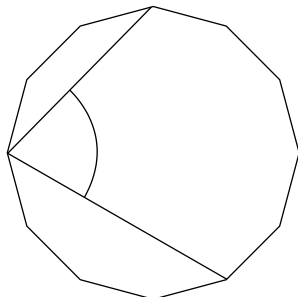
What is the value of x ?



A 60 B 75 C 90 D 120 E more information needed

3. The diagram shows a regular dodecagon (a polygon with twelve equal sides and equal angles).

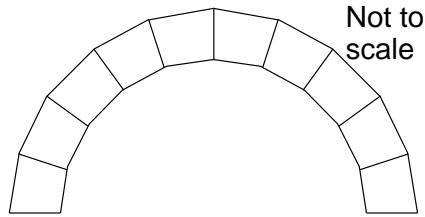
What is the size of the marked angle?



A 67.5° B 72° C 75° D 82.5° E 85°

4. Ten stones, of identical shape and size, are used to make an arch, as shown in the diagram. Each stone has a cross-section in the shape of a trapezium with three equal sides.

What is the size of the smallest angles of the trapezium?



- A 72° B 75° C 81° D 83° E 85°

5. What is the obtuse angle between the hands of a clock at 6 minutes past 8 o'clock?

- A 123° B 126° C 153° D 156° E 159°

6. In triangle PQR the point N lies on the side PR , and the point M lies on the side PQ . The segment QN bisects the angle PQR , and MN is parallel to QR .

Which of the following statements follows logically from this given information?

- A $MN = \frac{1}{2}QR$ B $MN = MQ$ C $MN = NP$
 D $MN = RN$ E Statements A-D may all be false

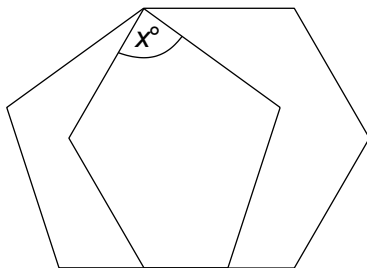
7. $ABCDEFGHI$ is a regular nine-sided polygon (called a 'nonagon' or 'enneagon').

What is the size of angle FAE ?

- A 10° B 20° C 30° D 40° E 50°

8. The diagram shows a regular pentagon and a regular hexagon which overlap.

What is the value of x ?



- A 82 B 84 C 85 D 87 E 91