TEST YOUR SKILLS

1 **TEST** Suppose that two circles C_1 and C_2 in the plane have no points in common. Then:

A there is exactly one line tangent to both C_1 and C_2.

B there are exactly two lines tangent to both C_1 and C_2.

C there are exactly three lines tangent to both C_1 and C_2.

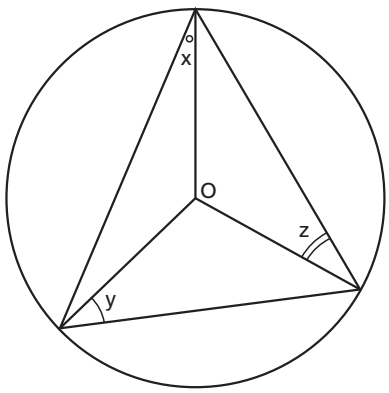
D there are no lines tangent to both C_1 and C_2 or there are exactly two lines tangent to both C_1 and C_2.

E there are no lines tangent to both C_1 and C_2 or there are exactly four lines tangent to both C_1 and C_2.

(USA *North Carolina State High School Mathematics Contest*, 2005)

2 **TEST** Triangle ABC is inscribed in circle O (with center O). What is $x + y + z$?

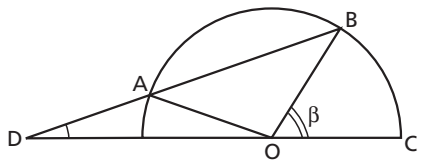
A 180°
B 90°
C 60°
D 40°
E 25°



(USA *Indiana State Mathematics Contest*, 2005)

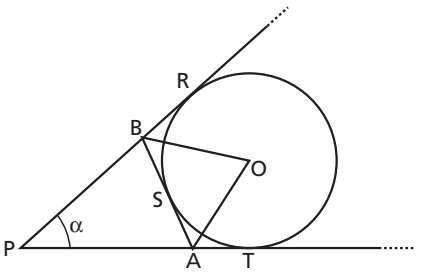
3 **TEST** In the figure below $DA = AO = BO$ and $B\hat{O}C = \beta$. What is $A\hat{D}O$?

A $\frac{1}{2}\beta$
B $\frac{1}{3}\beta$
C $\frac{1}{4}\beta$
D $90° - \beta$
E None of these.



(USA *North Carolina State High School Mathematics Contest*, 2004)

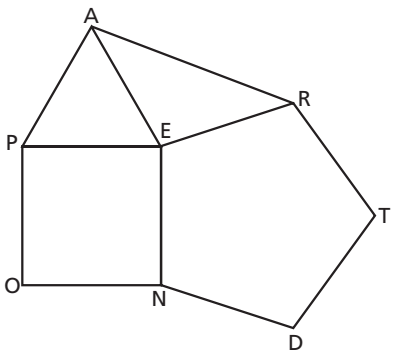
4 **TEST** Triangle ABO is formed by three tangents to circle O and $A\hat{P}B = \alpha$. What is the measure of angle $A\hat{O}B$?



A $\frac{9}{8}$
B $90° - \alpha$
C $\frac{11}{8}\alpha$
D $180° - \alpha$
E $90° - \frac{\alpha}{2}$

(USA *Indiana State Mathematics Contest*, 2005)

5 A regular pentagon is a five-sided figure which has all of its angles equal and all of its side lengths equal. In the diagram, *TREND* is a regular pentagon, *PEA* is an equilateral triangle, and *OPEN* is a square. Determine the size of $E\hat{A}R$.



(CAN *Canadian Open Mathematics Challenge, COMC*, 2002)

[39°]

6 **TEST** The midpoint of the hypotenuse of a right triangle is:

A equidistant from all three vertices.
B the intersection of the angle bisectors.
C the intersection of the three medians.
D the center of the incircle.
E none of these answers.

(USA *Northern State University: 52nd Annual Mathematics Contest*, 2005)

7 **TEST** Given the statement «If a pentagon is regular, then it is equiangular», which of the following is true?

A only the conditional is true.
B only the conditional and contrapositive are true.
C only the conditional, converse, and inverse are true.
D the conditional, converse, inverse, and contrapositive are all true.
E none of the statements are true.

(USA *University of North Carolina: Western Region State Mathematics Finals*, 2003)

GLOSSARY

angle bisector: bisettrice
circle: circonferenza, talvolta cerchio
conditional: ipotetica (diretta)
contrapositive: controinversa
converse: inversa
hypotenuse: ipotenusa
incircle: circonferenza inscritta
inscribed: inscritto
inverse: contraria
midpoint: punto medio
side: lato
size: taglia, ampiezza
square: quadrato
statement: enunciato, frase
tangent: tangente