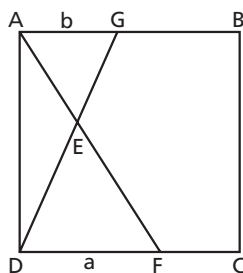# 🏴 TEST YOUR SKILLS

TEST

1 A 4 m flagpole is in front of a building. The shadow from the top of the flagpole coincides with the shadow from the top of the building. If the flagpole casts a 6 m shadow at the same time that the building casts a 24 m shadow, how tall is the building?

A 36 m
B 16 m
C 28 m
D 10 m
E None of the above.

(USA *Catawba College NCCTM Mathematics Contest*, 2005)

2 In the unit square, find the distance from E to AD in terms of a and b, the lengths of DF and AG, respectively.

A $\dfrac{ab}{a+b}$

B $\dfrac{b}{a+b}$

C $\dfrac{a-b}{a+b}$

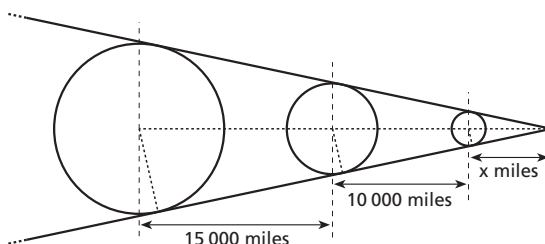D $\dfrac{a}{a+b}$

E $\dfrac{2a-b}{a+b}$

(USA *University of North Carolina: Geometry State Finals*, 2003)

3 Given two similar triangles one of which has twice the perimeter of the other, by what factor is the area of the larger triangle bigger than the smaller?

A 2
B 4
C $\sqrt{2}$
D $2\sqrt{2}$
E None of these.

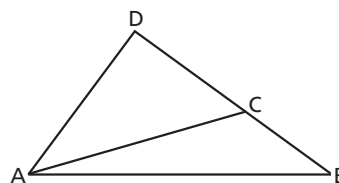(USA *North Carolina State High School Mathematics Contest,* 2004)

4 Three planets are aligned as shown. The diameter of the smallest planet is 3000 miles and the diameter of the planet in the middle is 8000 miles. Given the other dimensions in the figure, what is the diameter of the largest planet?

A 12 500 miles
B 12 800 miles
C 15 100 miles
D 15 500 miles
E None of these.

(USA *University of North Carolina: Geometry State Finals*, 1999)

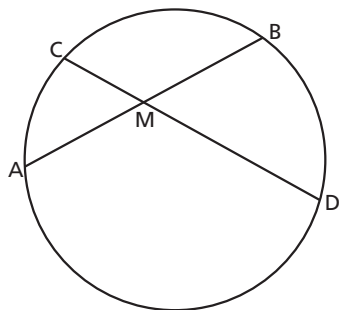**5** Given the triangle $A\hat{B}C$, one has: $AB = 20$, $BC = 7$, and $CA = 15$. Side BC is extended to point D so that $D\hat{A}B$ is similar to $D\hat{C}A$. What is DC?

A 9
B 10
C 11
D 12
E 13

(USA *University of South Carolina: High School Math Contest*, 2005)

6 Let *AB* be a chord of length 16 that is bisected by a second chord *CD*. How long is *CD* if *DM* is 3 times as long as *CM*?

A $\dfrac{8\sqrt{3}}{3}$

B $\dfrac{64}{3}$

C $8\sqrt{3}$

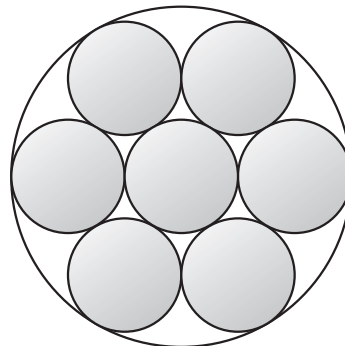D $\dfrac{32\sqrt{3}}{3}$

E $\dfrac{20\sqrt{2}}{3}$

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

7 Jack walks around a circle of diameter 24 feet. Jill walks around a square of side 19 feet. Who has walked farther?

(USA *Bay Area Math Meet, BAMM, Bowl Sampler,* 1995)

[Jill]

8 **TEST** Each of the small circles in the figure has radius one. The innermost circle is tangent to the six circles that surround it, and each of those circles is tangent to the large circle and to its small-circle neighbors. Find the area of the unshaded region.

A π
B 1.5π
C 2π
D 3π
E 3.5π

(USA *American Mathematics Contest 10, AMC 10,* Sample questions, 2002)

GLOSSARY

aligned: allineato	**flagpole**: asta di bandiera	**to surround**: circondare
building: edificio	**innermost**: il più interno	**top**: cima
to cast-cast-cast: proiettare	**length**: lunghezza	**twice**: doppio, due volte
chord: corda	**neighbor**: vicino	**unshaded**: non ombreggiato
to extend: prolungare	**planet**: pianeta	
factor: fattore	**radius**: raggio	