Answer # S1

**Sample Question 1**

In quadrilateral ABCD, AB=BC=CD. Also AC=BD. If AD = 12 and AB = 6, what is the area of quadrilateral ABCD?

Answer # S2

**Sample Question 2**

In a certain circle, a sector of area $45\pi$ has a central angle of $72°$. What is the length of the arc on this sector?

Answer # 1

**Question #1**

What is the distance, in simplest radical form, from the point (a+2, b-6) to the point (a-4, b+12)?

Answer # 2

**Question #2**

What is the greatest number of regions into which 6 lines can divide a plane?

Answer # 3

**Question #3**

Bobby and his big brother Barry are playing basketball. Bobby is younger, and plays on a smaller basketball goal. At 3:00 p.m. Bobby's basketball goal casts a 4 ft. shadow, while Barry's casts a 7 foot shadow. If Barry's goal is 4 ft. taller than Bobby's, how tall is Barry's goal (in feet)?

Answer # 4

**Question #4**

A certain kite has perimeter 66, a bisected diagonal of length 24, and one side is 7 more than the length of another side. What is the area of this kite?

Answer # 5

**Question #5**

Napoleon is holding a perfectly spherical orange in his hand. With one slice, he cuts the orange into two hemispheres and gives one of them to Pedro. To the nearest whole percent, the hemispherical orange piece has what percent of the surface area of the original orange?

Answer # 6

**Question #6**

Ripslinger leaves Airport A and travels directly north at 2.75 miles per minute. Dusty Crophopper leaves Airport B and flies directly east at 5 miles per minute. If Airport B is 40 miles due east of Airport A, how far apart will Ripslinger and Dusty be in 4 minutes?

Answer # 7

**Question #7**

An equilateral triangle has an altitude of length 12. What is the area of the triangle?

Answer # 8

**Question #8**

A circular dartboard of radius 8 inches has a square inscribed in it. This square has a circle inscribed in it, and this smaller circle has a smaller square inscribed in it. If a dart hits a random point on the circular dartboard, what is the probability that it lands inside the smaller circle?

Answer # 9

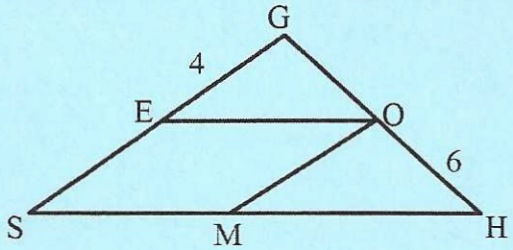
**Question #9**

Two concentric circles are drawn such that the area of the larger circle is sixteen times the area of the smaller circle. If a chord of the larger circle is tangent to the smaller circle, then what is the ratio of the length of that chord to the radius length of the smaller circle.

Answer # 10

**Question #10**

In triangle GHS, M is the midpoint of $\overline{HS}$. If MOES is a parallelogram with ME = 4, and the perimeter of triangle GEO is 15, find the area of triangle GHS.



Answer # 11

**Question #11**

A sphere fits snugly inside a right circular cylinder. If the volume of the sphere is $36\pi$, what is the surface area of the cylinder?

Answer # 12

**Question #12**

A regular tetrahedron has a side of length 6. What is the volume of the tetrahedron?