MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 – JANUARY 2008
ROUND 1 ANALYTIC GEOMETRY: ANYTHING

ANSWERS

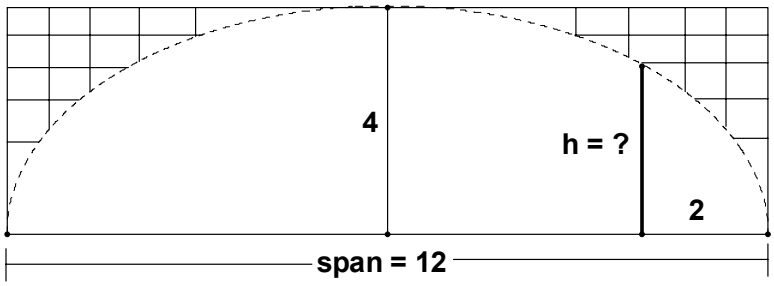
A) _____

B) _____

C) _____

A) The equation of a circle of radius 4 is $(x^2 + 4x) + (y^2 - 2y) + F = 0$.
Determine the value of F.

B) The arch of a bridge is in the form of half an ellipse, with a horizontal major axis. The span of the bridge is 12 meters and the height of the arch above water is 4 meters at its center. How high (in meters) above the water is the arch at a point on the water 2 meters from the end of the arch? Your answer must be exact.



C) A parabola has a focal chord with endpoints at (2, 0) and (2, 6) and opens to the right.
The point (2.5, y), where $y > 0$, lies on this parabola.
Compute all possible values of y.