

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 – DECEMBER 2007
ROUND 1 TRIG: RIGHT ANGLE PROBLEMS, LAWS OF SINES AND COSINES

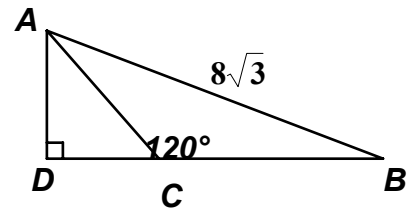
ANSWERS

A) _____

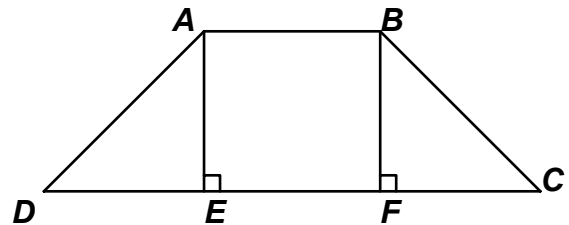
B) _____ : _____

C) _____

- A) Given: $\triangle ABC$ is isosceles, $m\angle ACB = 120^\circ$ $AB = 8\sqrt{3}$
Compute AD .



- B) The area of an isosceles trapezoid is 840 square units.
 Altitudes \overline{AE} and \overline{BF} divide the longer base into three segments of equal length. If the length of an altitude of the trapezoid is 1 unit less than the length of the longer base, what is the ratio of the perimeter of the trapezoid to the altitude of the trapezoid?



- C) In $\triangle ABC$, $AB = 4$, $AC = 6$, $m\angle C = 30^\circ$.
 Determine all possible values for the exact length of \overline{BC} in simplified radical form.