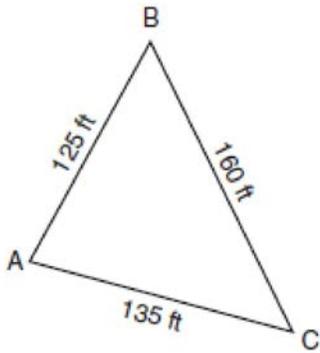


G.MG.A.3: Heron's Formula

1 A garden in the shape of an equilateral triangle has sides whose lengths are 10 meters. What is the area of the garden?

- 1) 25 m^2
- 2) $25\sqrt{3} \text{ m}^2$
- 3) 50 m^2
- 4) $50\sqrt{3} \text{ m}^2$

2 The accompanying diagram shows a triangular plot of land located in Moira's garden.



Find the area of the plot of land, and round your answer to the *nearest hundred square feet*.

3 A triangular plot of land has sides that measure 5 meters, 7 meters, and 10 meters. What is the area of this plot of land, to the *nearest tenth of a square meter*?

4 The Bermuda Triangle on a map is a section of the Atlantic Ocean bordered by line segments stretching from Miami to Bermuda to Puerto Rico and back to Miami. The distance from Miami to Bermuda is 1042 miles; the distance from Bermuda to Puerto Rico is 2057 miles; and the distance from Puerto Rico to Miami is 1127 miles. Find the area contained within the Bermuda Triangle, to the *nearest square mile*.

5 A farmer has determined that a crop of strawberries yields a yearly profit of \$1.50 per square yard. If strawberries are planted on a triangular piece of land whose sides are 50 yards, 75 yards, and 100 yards, how much profit, to the *nearest hundred dollars*, would the farmer expect to make from this piece of land during the next harvest?

6 A farmer has a triangular field with sides of 240 feet, 300 feet, and 360 feet. He wants to apply fertilizer to the field. If one 40-pound bag of fertilizer covers 6,000 square feet, how many bags must he buy to cover the field?

G.MG.A.3: Heron's Formula**Answer Section**

1 ANS: 2

An equilateral triangle with sides whose lengths are 10 has a perimeter of 30 and a semi-perimeter of 15.

$$A = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{15(15-10)(15-10)(15-10)} = \sqrt{1875} = \sqrt{625\sqrt{3}} = 25\sqrt{3}$$

REF: 010417b

2 ANS:

$$p = 420 \quad s = 210$$

$$8,200. \quad A = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{210(210-160)(210-135)(210-125)} = \sqrt{66937500} \approx 8200$$

REF: 060933b

3 ANS:

$$p = 22 \quad s = 11$$

$$16.2. \quad A = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{11(11-5)(11-7)(11-10)} = \sqrt{264} \approx 16.2$$

REF: 060634b

4 ANS:

$$S = \frac{1042 + 2057 + 1127}{2} = 2113 \quad A = \sqrt{2113(2113-1042)(2113-2057)(2113-1127)} \approx 353,490$$

REF: 081639a2

5 ANS:

$$p = 225 \quad s = 112.5$$

$$2700. \quad A = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{112.5(112.5-50)(112.5-75)(112.5-100)} \approx \sqrt{3295898.4} \approx 1815$$

$$1815 \times \$1.50 \approx \$2700$$

REF: 060333b

6 ANS:

6.

$$p = 900 \quad s = 450$$

$$A = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{450(450-240)(450-300)(450-360)} = \sqrt{1275750000} \approx 35718 \quad 35718 \div 6000 \approx 6$$

REF: 080734b