Mathematics Problem of the Week 10

This week's winner is: James Guerry

Contact Tariq Nuruddin at Surrey MAC or Judy Bicep (Richmond,3335) for your prize or email MathProblem@kpu.ca.

Also submitting correct solutions to problem 269 was: Suzzane Pierce.

Solution provided by James Guerry

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Let x be the total number of bars, which is equal to the total number of acres the field covers. Therefore, the perimeter of the field (in yards) can be expressed as:

$$P = \frac{2.75}{7}x$$

The area of the field (in square yards) can be expressed as:

$$A = 4840x$$

The length of one side, s, can be expressed as:

$$s = \frac{1}{4}P = \frac{11}{112}x$$

Therefore, the area may also be expressed as:

$$A = s^2 = \left(\frac{11}{112}x\right)^2 = \frac{121}{12544}x^2$$

Therefore,

$$\frac{121}{12544}x^2 = 4840x$$

$$\frac{121}{12544}x^2 - 4840x = 0$$

$$x\left(\frac{121}{12544}x - 4840\right) = 0$$

In context, we can exclude the solution $x = 0$. Therefore,

$$\frac{121}{12544}x - 4840 = 0$$

$$\frac{121}{12544}x = 4840$$

$$x = 501760$$

$$s = \frac{11}{112}x = \frac{11}{112}(501760) = 49280$$

So the length of the side of the field must be 49280 yards, or 28 miles.