Problems of the Month

November 2015
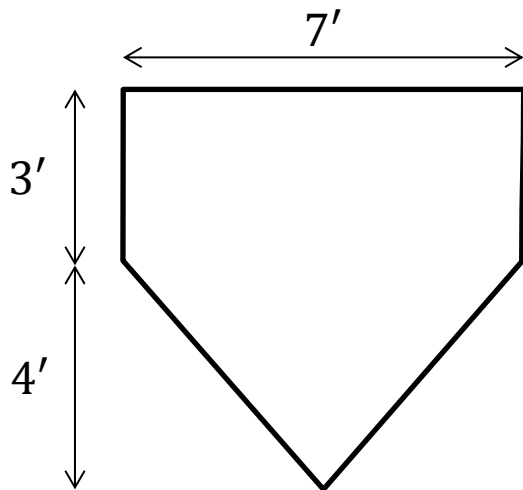
General Problem:

The interior dimensions of a square room measure $20' \times 35' \times 7'10''$. The walls will be covered in drywall that comes in $4' \times 8'$ sheets. These sheets of drywall cost $30 each. How much does it cost to cover the room?

Calculus Problem:

A ship in the ocean is leaking! Luckily they have a bilge pump. The boat has a constant pentagonal cross-section as shown here, and is 22 feet long. The bilge pump can pump out 10 gallons of water per minute.

$7'$

$3'$

$4'$

One boater uses their stopwatch and finds when the water was at a height of 1.5 feet, the water level was increasing at 1 inch per 5 seconds.

Assuming the leak stays constant, how long until the boat is completely full of water?

Challenge Problem:

Find the area of the largest equilateral triangle that fits in a square of side length 1.

?