A newly constructed community swimming pool that is 75 ft by 48 ft is to be filled with water. If it takes 202.5 gallons of water to fill a cubic yard, how many gallons of water will it take to fill this swimming pool to a uniform depth of 6 ft?

Since we know that it takes 202.5 gallons of water to fill a cubic yard, let’s convert the measurements from feet to yards. The length of the pool is 75 ft, which is equivalent to 75 ÷ 3 = 25 yards. The pool’s width of 48 ft equals 48 ÷ 3 = 16 yards. The depth of water in the pool is to be 6 ft, or 6 ÷ 3 = 2 yards. Therefore, the swimming pool has 25 × 16 × 2 = 800 cubic yards that need to be filled with water. The amount of water needed to fill 800 cubic yards is 202.5 × 800 = 162,000 gallons of water.

Using two hoses, it took 22.5 hours to fill the old community pool with 27,000 gallons of water. The two hoses used to fill the old pool were replaced by three new hoses, which will be used to fill the newly constructed pool from the previous problem. If each new hose has a capacity 1.5 times the combined capacity of the two hoses used to fill the old pool, how many hours will it take to fill the new community pool to a uniform depth of 6 ft?

The two hoses filled the old pool with water at a rate of 27,000 ÷ 22.5 = 1200 gallons per hour. A hose with a capacity that is 1.5 times the combined capacity of these two hoses will pump the water into the pool at a rate of 1200 × 1.5 = 1800 gallons per hour. Since three of these hoses will be used, together they will pump 1800 × 3 = 5400 gallons of water per hour. Therefore, to fill the newly constructed pool from the previous problem with 162,000 gallons of water, using the three new hoses, will take 162,000 ÷ 5400 = 30 hours.

If 1/2 gallon of chlorine is required per 20,000 gallons of water, what is the positive difference in the amount of chlorine used for the new pool and the amount used for the old pool? Express your answer as a decimal to the nearest tenth.

For the old pool, the 27,000 gallons of water would require 27,000 ÷ 20,000 × (1/2) = 0.675 gallons of chlorine. For the newly constructed pool, 162,000 gallons of water requires 162,000 ÷ 20,000 × (1/2) = 4.05 gallons of chlorine. That’s a difference of 4.05 – 0.675 = 3.375 = 3.4 gallons of chlorine.