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MATH 100
Fall 2023
HW 5: Due 09/25

"That's because losers look stuff up while the rest of us are carpin' all them diems."
– Summer Smith, Rick & Morty

Problem 1. (10pt) Suppose you have a large 'rectangular' vat that is 15 ft $\times$ 10 ft $\times$ 4 ft and a large, hollow sphere that is 8 ft across. The 'rectangular' container is halfway filled with water.

(a) If water begins flowing into the 'rectangular' vat at a rate of 9 ft^3 of water per minute, how long will it take to fill the vat?

(b) If the sphere begins empty, at what rate would water have to flow into the sphere to fill the sphere with water in the same time it took to fill the container in (a)?

Solution.

(a)

(b)

Problem 2. (10pt) You plan on traveling to your summer cottage. The cottage is located 50 mi east and 30 mi north of where you live. If you will drive along a highway approximately straight toward the cottage at 65 mph, how long will it take you to arrive at the cottage?

Solution.

Problem 3. (10pt) Suppose that one roofer can put a new roof on a house 1.3 times faster than another worker. If working together, they can roof a house in 6 days, how many days would it take the slower worker to roof a house working alone?

Solution.

Problem 4. (10pt) Use a Fermi estimation to approximate how many hot dogs are sold at Yankee Stadium each year. Be sure to show your work and fully justify your reasoning.

Solution.