Math 180 Practice Exam 2

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Name _____

1) Air is being pumped into a spherical balloon at a rate of 5 cm^3/min. Determine the rate at which the radius of the balloon is increasing when the diameter of the balloon is 20 cm

2) Given a function $f(x) = \sqrt{x}$, find an approximation of $\int_0^4 f(x)dx$ using:

- left Riemann sums, splitting the interval into 4 pieces.

- right Riemann sums, splitting the interval into 4 pieces.

3) A piece of wire of length 50 cm is cut into two pieces. One piece is shaped into a circle and the other is shaped into a square. Where should the wire be cut to minimize the sum of the area of the two shapes?

4)Given vectors $u =< 1, 4 >, v =< -3, 6 >$ and $w =< -8, 2 >$ compute/find:

- $u \cdot v$

- $v \cdot w$

- Which pairs of vectors are orthogonal?

- $\text{proj}_u(v)$

- $\text{proj}_u(w)$

5) Given $f(x) = 2x^3 - 9x^2 - 108x + 2$ determine **a)** the intervals of increase/decrease, **b)** the intervals upon which f is concave up/down, **c)** local mins/maxes, and **d)** the inflection points.