

2. [15 points] The parts of this problem are unrelated to each other. Be sure to show work for all parts, and circle your final answer.
- a. [5 points] A leaking bag of sugar is lifted vertically from the ground to a height of 10 feet above the ground. The **weight** of the bag of sugar is $6 - \sqrt{x}$ lbs when it has been lifted x feet above the ground. Find the work done lifting the bag, including units. Fully evaluate any integrals, but you do not need to simplify your answer.

Answer: _____

- b. [5 points] Write an expression involving one or more integrals that gives the volume of the solid obtained by rotating the region in the xy -plane bounded between the x -axis, the parabola $y = x^2 + 1$, the line $x = -1$ and the line $x = 1$, about the line $x = -2$. Do not evaluate your integral(s).

Answer: _____

- c. [5 points] The function $f(x) = x^4 + 5$ can be rewritten in the form $f(x) = (x + 1)^4 + A(x + 1)^3 + B(x + 1)^2 + C(x + 1) + D$, where A, B, C, D are constants. Find the values of A, B, C, D using Taylor series. Other methods used to find the constants will not be given credit.

$A =$ _____

$B =$ _____

$C =$ _____

$D =$ _____