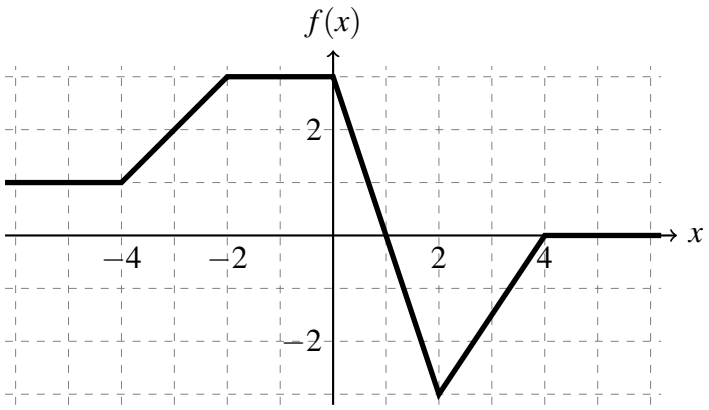
Name: _____ _____ / 25

Circle one: **Faudree (F01)** | **Bueler (F02)** | **VanSpronsen (UX1)**

25 points possible. **No aids (internet, other students, book, calculator, etc.) are permitted.** You do not need to simplify final answers, but **answers without supporting work will lose points for completeness and effort.**

1. [6 points] The graph of f is shown. Evaluate each integral by interpreting it in terms of areas.



a. $\displaystyle\int_{-4}^{0} f(x)\,dx =$

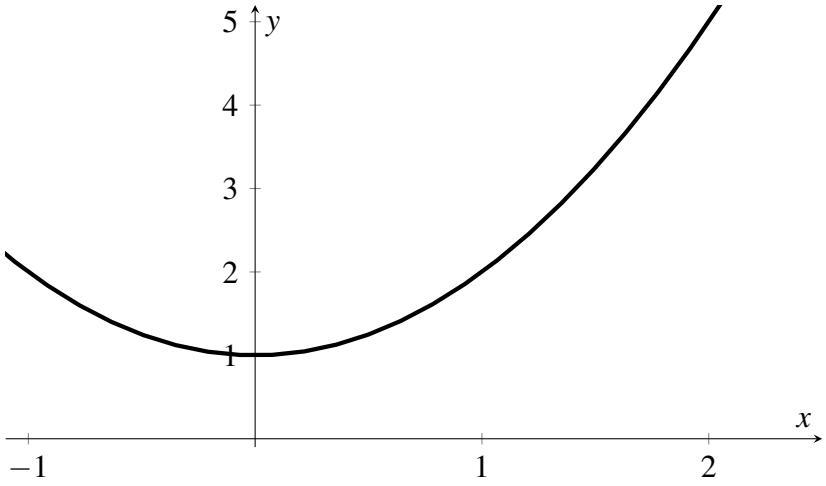
b. $\displaystyle\int_{0}^{4} f(x)\,dx =$

c. $\displaystyle\int_{4}^{-2} f(x)\,dx =$

2. [6 points] A particle is moving with the given acceleration $a(t)$ and other data. Find the position $s(t)$ of the particle.

$$a(t) = \sin t + \cos t, \quad s(0) = 3, \quad v(0) = 4$$

3. [8 points] Consider the graph of $f(x) = 1 + x^2$ below.



a. In the figure above, sketch three rectangles corresponding to the $n = 3$ Riemann sum on the interval $-1 \leq x \leq 2$. Use right endpoints.

b. Compute the numerical value of the Riemann sum illustrated in part **a**. Express your answer as an integer.

c. Is your numerical value in part **b** an overestimate or an underestimate of $\int_{-1}^{2} 1 + x^2\, dx$?

4. [5 points] Evaluate the integral by interpreting it in terms of areas:

$$\int_{-2}^{3} |\tfrac{1}{2}x|\, dx$$