ID: 1

Calculus Homework Name Key

Evaluating Definite Integrals

Date________ Period____

Evaluate each definite integral. Note: For problems 1-4, compare your numerical answer to the area shown to see if it makes sense. Remember, the definite integral represents the area between the function and the x-axis over the given interval. Area above the x-axis is positive. Area below the x-axis is negative. SC-S

1) $\int_{\frac{\pi}{3}}^{\pi} \sin x\, dx = -\cos x \Big|_{\pi/3}^{\pi}$

$= -\cos\pi - (-\cos{}^{\pi}/3) = 1 + 1/2 = \boxed{1.5u^2}$

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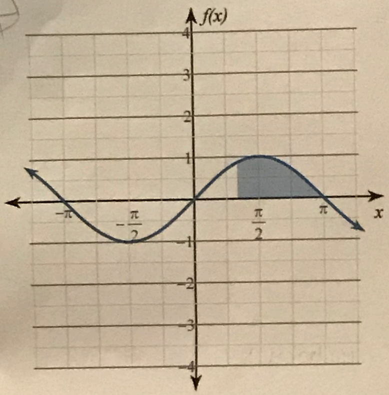
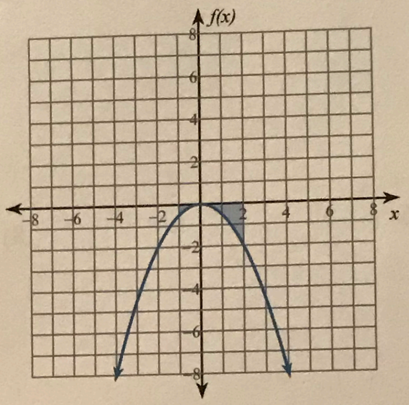


2) $\int_{-1}^{2} -\frac{x^2}{2}\, dx = -\frac{1}{2}\int_{-1}^{2} x^2 dx = -\frac{1}{2}\left(\frac{x^3}{3}\right) = -\frac{x^3}{6}\Big|_{-1}^{2}$

$= -\frac{(2)^3}{6} - -\frac{(-1)^3}{6} = -\frac{8}{6} - \frac{1}{6}$

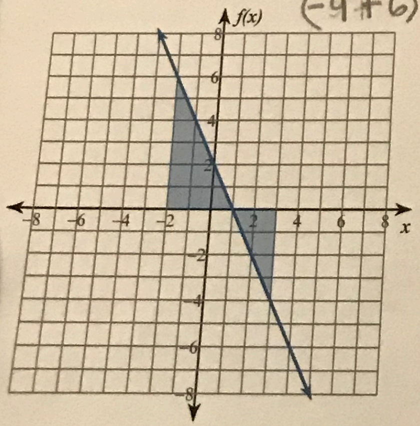
$= -\frac{9}{6} = \boxed{-\frac{3}{2}}$



3) $\int_{-2}^{3} (-2x+2)\, dx = -\frac{2x^2}{2} + 2x = -x^2 + 2x \Big|_{-2}^{3}$

$(-9+6) - (-4-4) = -3+8$

$= \boxed{5u^2}$



4) $\int_{-1}^{2} (x^3 - x^2 + 1)\, dx = \frac{x^4}{4} - \frac{x^3}{3} + x \Big|_{-1}^{2}$

$= \left(\frac{2^4}{4} - \frac{2^3}{3} + 2\right) -$

$\left(\frac{(-1)^4}{4} - \frac{(-1)^3}{3} - 1\right)$

$= \left(4 - \frac{8}{3} + 2\right) -$

$\left(\frac{1}{4} + \frac{1}{3} - 1\right)$

$= \left(\frac{6}{1} - \frac{8}{3}\right) - \left(\frac{3}{12} + \frac{4}{12} - \frac{12}{12}\right)$

$= \frac{18-8}{3} - \left(\frac{-5}{12}\right)$

$= \frac{10}{3} + \frac{5}{12}$

$= \frac{40+5}{12} = \frac{45}{12} = \boxed{\frac{15}{4}}$