Integrals AREA UNDER CURVE ***NAME***

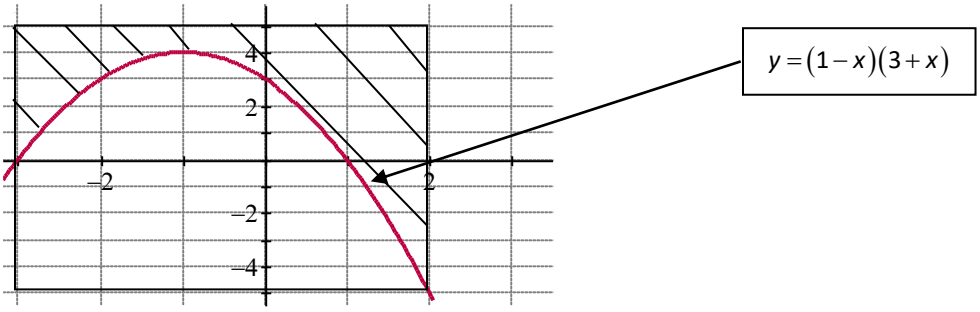
DATE **PER**

Find the area between the curve and the x-axis on the given interval without a calculator. Include a shaded graph with your answer.

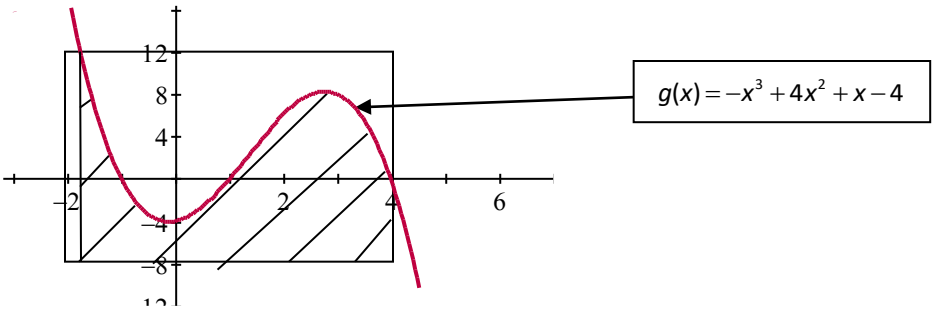
1. $y = x^2$, [-1,1]
2. $g(x) = \sin x; [0, \pi]$
3. $f(x) = x^3 - x^2;\ [-1,2]$
4. $f(x) = -x^2 + 2x;\ [-2,2]$
5. $f(x) = -x^3;\ [-2,2]$
6. $f(x) = x^3 + 1;\ [-2,1]$

Find the area of the striped and non-striped regions within the rectangle .

7.



8. –

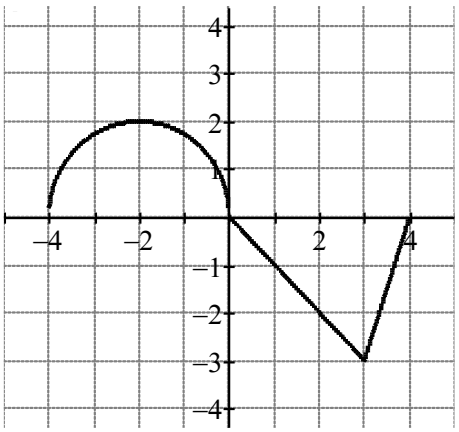


Find k for each.

9. $\int_{-1}^{2} (2x - k)dx = 16$
10. $\int_{1}^{4} \left(k\sqrt{x}\right)dx = 8$

Find the integral of each without a calculator.

11. $\int_{-1}^{2} x\sqrt{x+2}\ dx$
12. $\int_{0}^{1} \frac{2x}{\left(x^2+3\right)^3}$



RECALL - Area Accumulation

13. If $g(x) = \int_{0}^{x} f(x)\ dx$ and the graph of f is at the right, answer each.

   a. Find g(0), g(-4), g(4)
   b. Name the x-value that is the maximum and minimum value of g
   c. Where is g concave up? Why?
   d. Where is the g increasing? Why?
   e. Find the slope of g at x = 3 and x =-2.

Answers

1. 2/3
2. 2
3. 25/12
4. 8
5. 8
6. 19/4
7. 50/3
8. 60.418
9. -13/3
10. 12/7
11. 46/15
12. 7/288
13. –
    a. g(0) = 0, g(-4) = -2pi, g(4) = -6
    b. max at x = 0
       min at x = -2pi
    c. concave up at (-4,-2), (3,4), since g'' = f' and f is **increasing** on those intervals.
    d. Increasing at (-4,0) since g'= f and f is **positive** on (-4,0)
    e. Since g' = f , g'(3) = f(3) = -3 and g'(-2) = f(-2) = 2