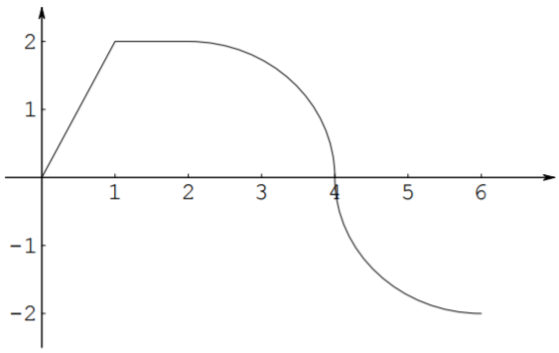
**Area Accumulation!**
**Calculus AB**

Suppose that f is the function shown at the right (made up of 2 lines and 2 quarter circles) and g(x) is defined as $g(x)=\int_0^x f(t)\,dt$ .




1. Find the values of g(0), g(1), g(2), g(4), g(6)
2. Find the values of $g'\left(\frac{1}{2}\right),\ g'(1),\ g'(4),\ g'(6)$
3. Find the values of $g''\left(\frac{1}{2}\right),\ g''(1),\ g''(1.5)$
4. Over what intervals is g increasing? Justify your answer.
5. Over what intervals is g concave up? Justify your answer.
6. Where does g have a point of inflection? Justify your answer.
7. Where does g have its absolute maximum on [0, 6]. Justify your answer.

$F(x)=\int_o^x f(t)\,dt$

8. Find $F(0),\ F(0),\ F(2),\ F(-1)$
9. Make a rough sketch of F. You can use your results from 8.
10. Shade in and find the area represented by $F(3)-F(1)$ .
11. Which is larger $F(3)$ or $F(4)$ ? Explain your reasoning.
12. Which is larger $F(5)$ or $F(6)$ ? Explain your reasoning.
13. Find $F'(4)$ and $F''(4)$ .
14. What feature of F is at x = 5. How can you tell?
15. Over what intervals is F concave down? Justify your answer.
16. Where is F decreasing? Justify your answer.

Review!

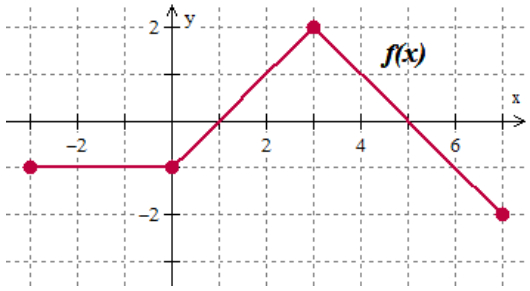
Evaluate without a calculator. Use proper notation.

17. $\int_1^4 \frac{dx}{\sqrt{x}}$

18. $\int_{-1}^{1} 5x^2 - 4x + 2 \; dx$

19. $\int_1^3 \frac{x+2}{x^3} dx$

Use the graph to find each.




20. $\int_0^4 f(x)dx$

21. $\int_{-2}^{6} f(x)dx$

22. Find the average value of $f(x)$ on $[-3,7]$.

The rate that fuel enters a tank is shown in the graph. There is 440 gallons in the tank at t = 0.


23. How much gas is in the tank at t = 7?

24. When is there the most gas in the tank? How much?

25. When is there the least gas in the tank? How much?

26. How much gas is in the tank at t = 2?

Answers 2 –

17. 2
18. 22/3
19. 14/9
20. 2
21. 1
22. -0.15
23. 560 gal
24. At t = 3, 660 gal
25. At t = 0, 440 gal
26. 650 gal