

1) The graph of g consists of two straight lines and a semicircle, as shown. Use it to evaluate each integral.

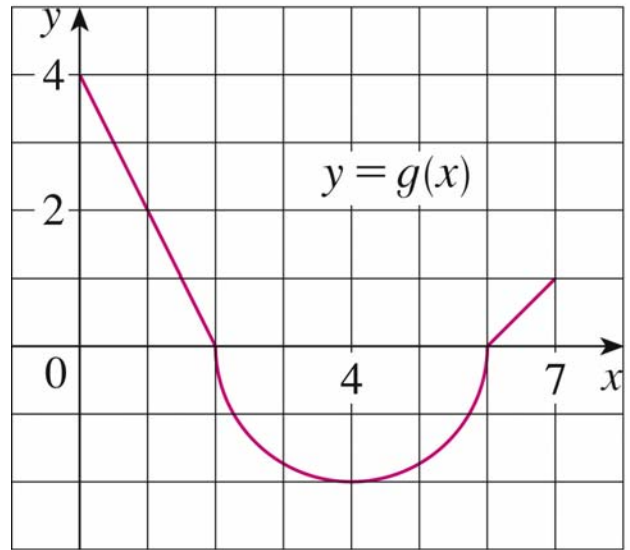
a) $\int_1^1 g(x) dx$

b) $\int_2^0 g(x) dx$

c) $\int_2^6 g(x) dx$

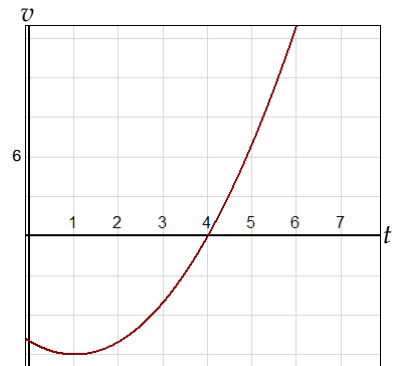
d) $\int_0^6 g(x) dx$

e) $\int_2^6 (1 - 2 \cdot g(x)) dx$



2) The velocity function (in meters per second) for a particle moving in a straight line is given by $v(t) = t^2 - 2t - 8$ and its graph is shown.

- a) At what time does the particle change direction (if any)?
- b) Determine the acceleration of the particle at 4 s.
- c) Determine the displacement of the particle between 1 s and 6 s.
- d) Determine the distance traveled by the particle between 1 s and 6 s.
- e) Can you determine where the particle is at $t = 6$ s? If yes, do so, with supporting work. If not, explain why not.



3) Water flows out from a leak in the bottom of a covered storage tank at a rate of $r(t) = 200 - 4t$ liters per minute, where $0 \leq t \leq 50$ min.

- a) Find the amount of water that flows from the leak in the first 10 minutes.
- b) Can you determine how much water was in the tank at $t = 0$? If yes, do so with supporting work. If not, explain why not.