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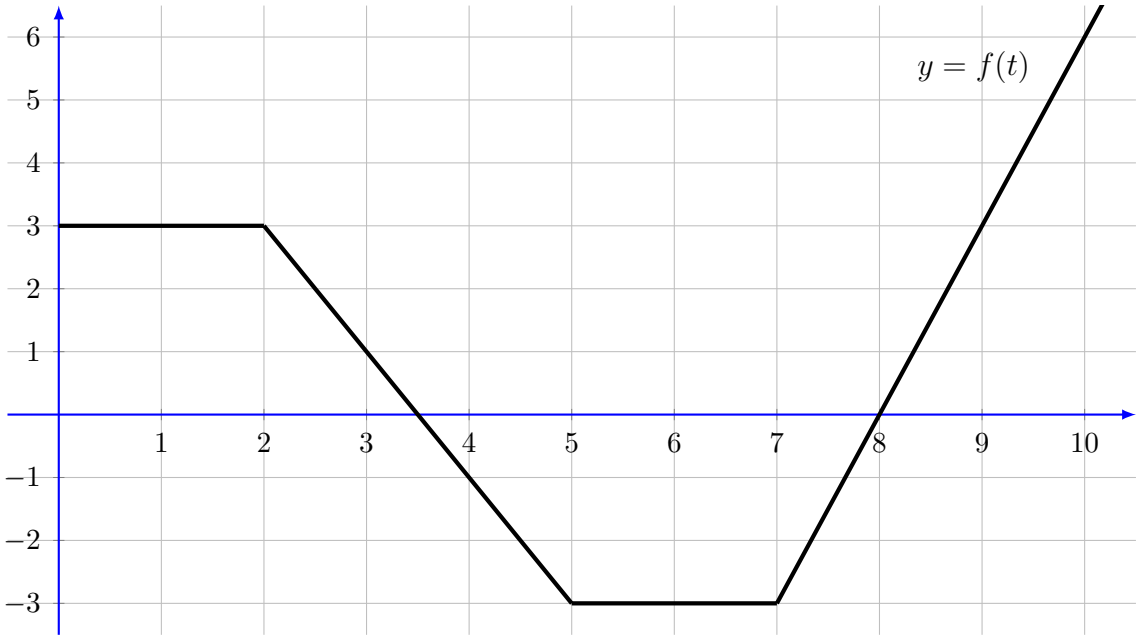
Part I: Use the picture

The graph of a function f is sketched below. Define an "Area function" A by

$$A(x) = \int_2^x f(t)dt$$



Use the picture and the definition of A to answer these questions:

1. What is $A(0)$?

2. What is $A(2)$?

3. What is $A(4)$?

4. Where is A increasing?

5. Where is the minimum of A?

6. Where is A concave up?

Part II: Matching

Match the expression on the left with the appropriate choice on the right. Put the letter of the choice on the answer sheet.

7. $\displaystyle\int_0^8 |2x-6|\,dx$

(a) 34

8. $\displaystyle\int_0^2 2x^2-3\,dx$

(b) $-\dfrac{2}{3}$

9. $\displaystyle\int_0^1 x+\sqrt{1-x^2}\,dx$

(c) $\dfrac{\pi+2}{4}$

10. $\displaystyle\int_0^{\frac{\sqrt{\pi}}{2}} 2x\sin(x^2)\,dx$

(d) $1-\dfrac{1}{\sqrt{2}}$

11. $\displaystyle\lim_{n\to\infty}\sum_{i=1}^{n}\left(\frac{i}{n}\right)^2\left(\frac{1}{n}\right)$

(e) $\dfrac{1}{3}$

Part III: True or False

12. The function g defined by $g(x) = \int_0^x \sin(t^2)\,dt$ has an absolute maximum at $x = \sqrt{2\pi}$.

13. $\dfrac{d}{dx}\left(\int_1^3 \sin(t^2)\,dt\right) = 0.$

14. If f' is continuous, then $\int_1^3 f'(v)\,dv = f(3) - f(1)$.

15. If f and g are integrable on the interval $[a, b]$ then

$$\int_a^b f(x)g(x)\,dx = \left(\int_a^b f(x)\,dx\right)\left(\int_a^b g(x)\,dx.\right).$$

16. If f and g are integrable on the interval $[a, b]$ then

$$\int_a^b [5f(x) + g(x)]\,dx = 5\int_a^b f(x)\,dx + \int_a^b g(x)\,dx.$$