# CALCULUS
## Antidifferentiation problems
## NEW

0560-1. NEW Find all antiderivatives in $x$ of

$$\sqrt{2}x^3 - x^2 + ex.$$

0560-2. NEW Find all antiderivatives in $t$ of

$$\left(\pi \sqrt[5]{t} - 2\sqrt[3]{t}\right) t.$$

0560-3. NEW Find all antiderivatives in $t$ of

$$\frac{\sqrt[6]{t} + 8\sqrt[7]{t}}{\sqrt[5]{t}}.$$

0560-4. NEW Find all antiderivatives in $s$ of

$$\frac{7e^s + \cos s}{3}.$$

0560-5. NEW Find the unique $f(x)$ such that

$$f'(x) = 5x^4 + 9x^2 - 6x \quad \text{and} \quad f(0) = 2.$$

0560-6. NEW Find the unique $f(x)$ such that

$$f'(x) = \frac{3x^2 + 4}{x\sqrt[8]{x}} \quad \text{and} \quad f(1) = 0.$$

0560-7. NEW Find the unique $h(t)$ such that

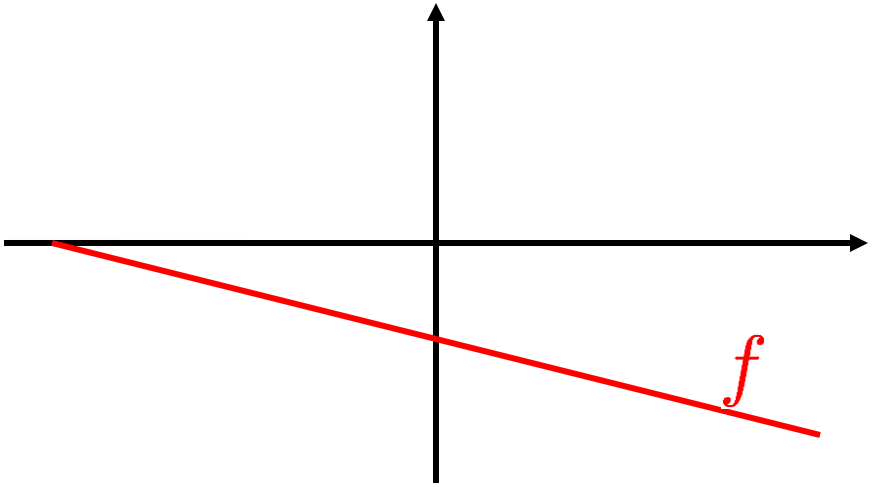
$$h'(t) = 2\sin t + 7\cos t \quad \text{and} \quad h(0) = 4.$$

0560-8. NEW Find the unique $p(t)$ such that

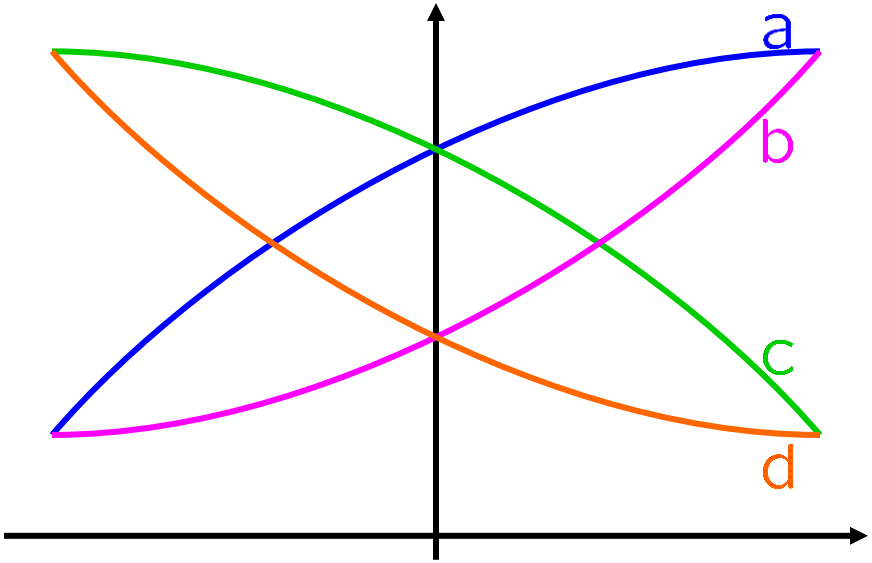
$$p''(t) = -2e^t + 4t^3, \; p'(0) = -4 \text{ and } p(0) = \sqrt{2}.$$

NEW

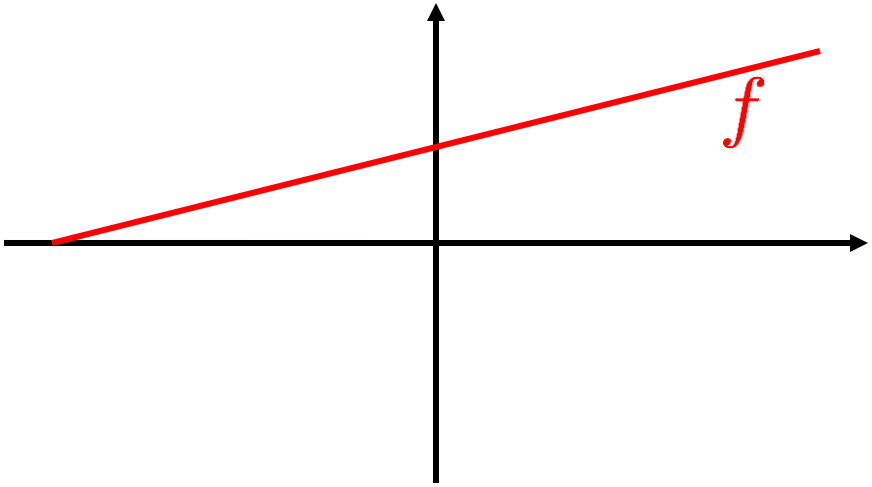
0560-9. The graph of $f$ is shown below.



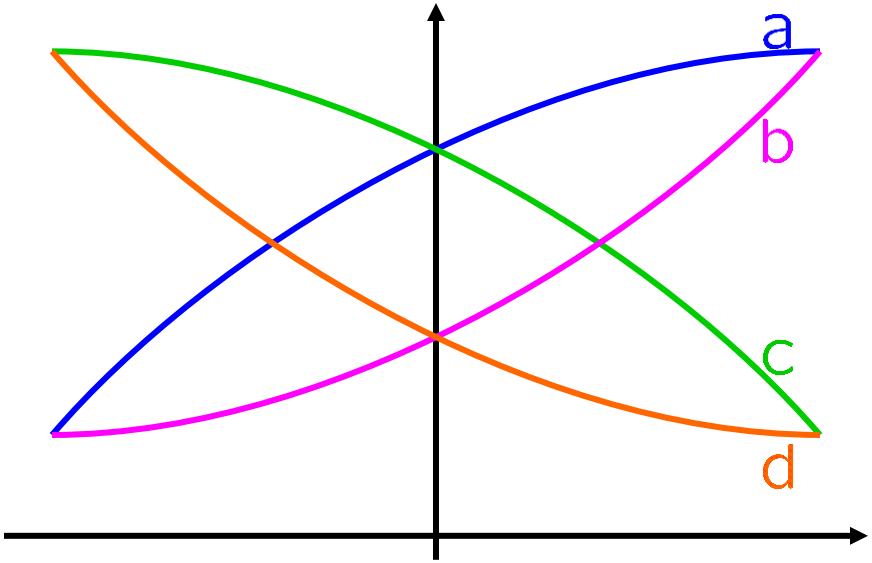

Which of the following could be the graph of an antiderivative of $f$?



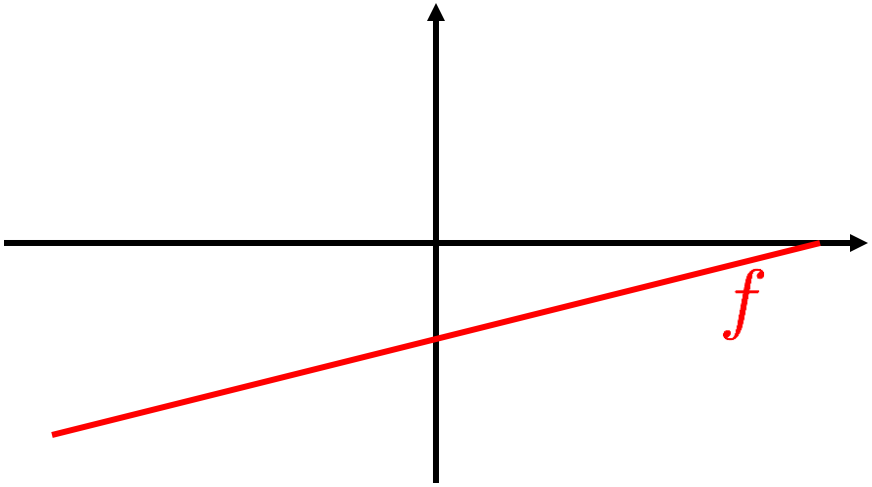
0560-10. The graph of $f$ is shown below.
NEW



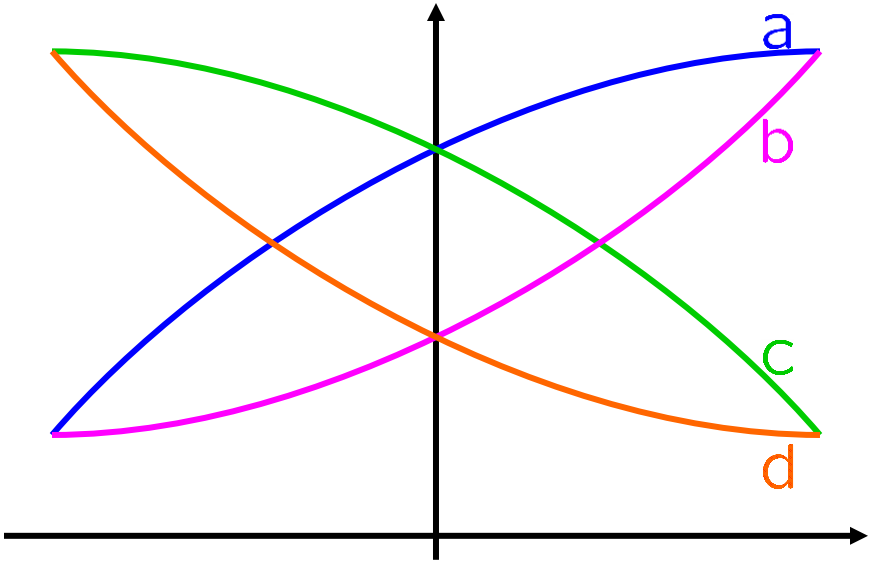

Which of the following could be the graph of an antiderivative of $f$?



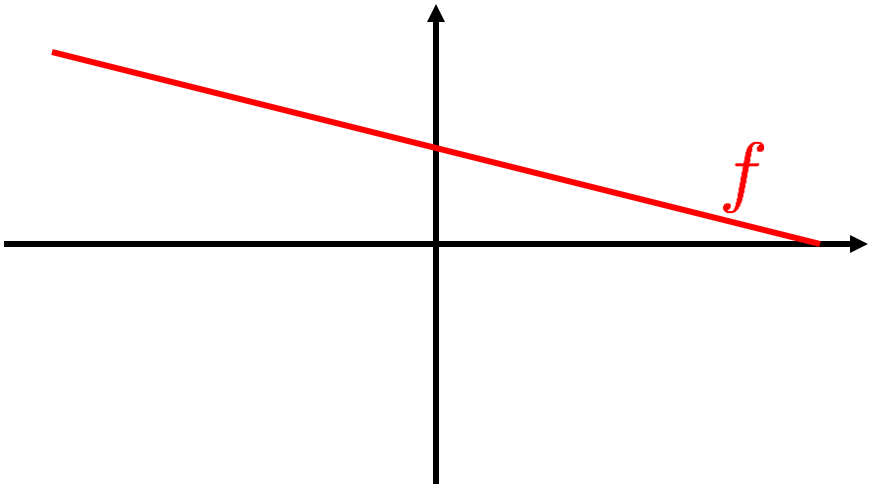
0560-11. The graph of $f$ is shown below.
NEW



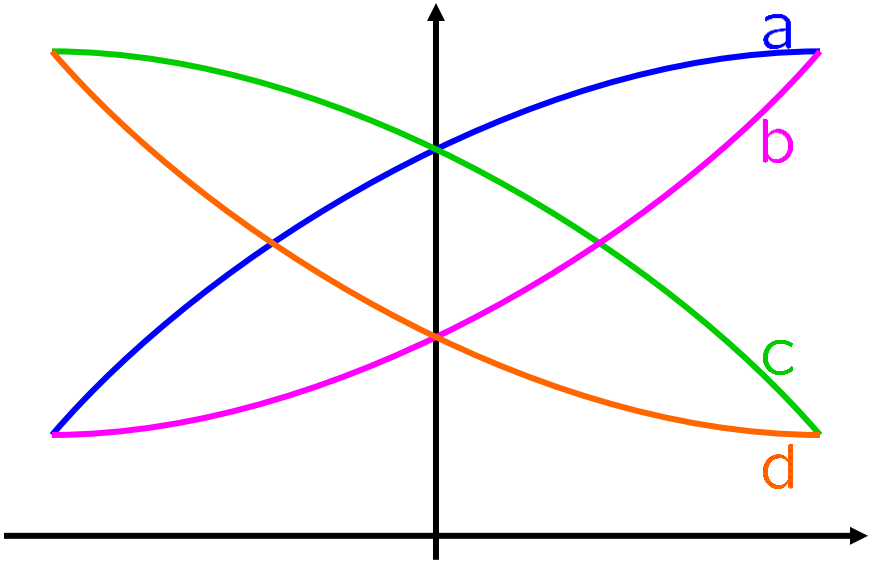

Which of the following could be the graph of an antiderivative of $f$?



0560-12. The graph of $f$ is shown below.
NEW




Which of the following could be the graph of an antiderivative of $f$?



0560-13. A particle travels on a number line.
NEW
Suppose
its acceleration at time $t$ is $6t^2 - 2t + 3$,
its position at time 0 is 4
and its velocity at time 0 is $-5$.
Find an expression for its position at time $t$.

0560-14. We drop a heavy ball out of a window
NEW
in a tall building. Its speed at the moment of impact with the ground is 144 feet per second. From what height was it dropped?