

2017 AP[®] CALCULUS AB FREE-RESPONSE QUESTIONS

CALCULUS AB
SECTION II, Part B

Time—1 hour

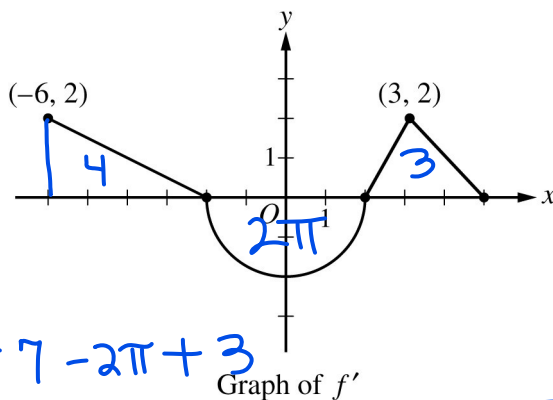
Number of questions—4

NO CALCULATOR IS ALLOWED FOR THESE QUESTIONS.

① $f(-2) + \int_{-2}^x f'(t) dt = f(x)$

② $f(-6) = 7 + \int_{-2}^{-6} f'(t) dt$
 $7 - 4 = 3$

$f(5) = 7 + \int_{-2}^5 f'(t) dt = 7 - 2\pi + 3$



3. The function f is differentiable on the closed interval $[-6, 5]$ and satisfies $f(-2) = 7$. The graph of f' , the derivative of f , consists of a semicircle and three line segments, as shown in the figure above.

✓ (a) Find the values of $f(-6)$ and $f(5)$.

✓ (b) On what intervals is f increasing? Justify your answer. $\rightarrow f' > 0$ $(-6, -2)$ $(2, 5)$

(c) Find the absolute minimum value of f on the closed interval $[-6, 5]$. Justify your answer.
 \hookrightarrow critical pt $f = 0$ or f' und $\rightarrow x = -2, 2$

(d) For each of $f''(-5)$ and $f''(3)$, find the value or explain why it does not exist.

x	$f(x)$
-6	3
-2	7
2	$7 - 2\pi$
5	$10 - 2\pi$

④

$f''(-5) = -\frac{2}{4}$

$f''(3)$ Does not exist
Sharp turn

$\lim_{x \rightarrow 3^-} f''(x) \neq \lim_{x \rightarrow 3^+} f''(x)$