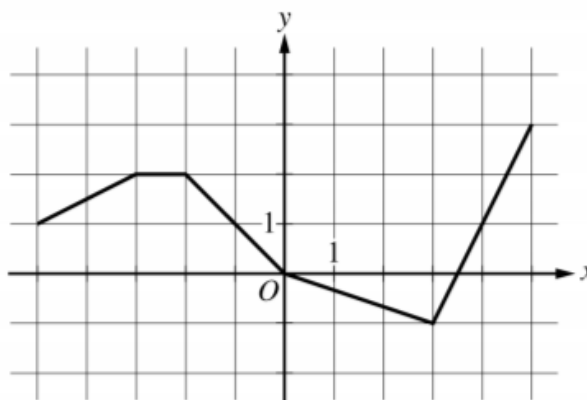## 2017 AP CALCULUS AB FREE-RESPONSE QUESTIONS

x	$g(x)$	$g'(x)$
−5	10	−3
−4	5	−1
−3	2	4
−2	3	1
−1	1	−2
0	0	−3

Graph of h

6. Let f be the function defined by $f(x) = -x^2 + 4x$. Let g be a differentiable function. The table above gives values of g and g' at selected values of x. Let h be the function whose graph, consisting of five line segments, is shown in the figure above.

(a) Find the slope of the line tangent to the graph of f at $x = 1$.

(b) Let k be the function defined by $k(x) = h(x)f(x)$. Find $k'(2)$.

(c) Let m be the function defined by $m(x) = \dfrac{g(x)}{h(x)}$. Find $m'(-4)$.

(d) Is there a number c in the closed interval $[-5,0]$ such that $g(c) = 4$? Justify your answer.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	-6	3	2	8
2	2	-2	-3	0
3	8	7	6	2
6	4	5	3	-1

6. The functions f and g have continuous second derivatives. The table above gives values of the functions their derivatives at selected values of x.

   (a) Let $k(x) = f(x)g(x)$. Write an equation for the line tangent to the graph of k at $x = 3$.

   (b) Let $h(x) = \dfrac{g(x)}{f(x)}$. Find $h'(1)$.