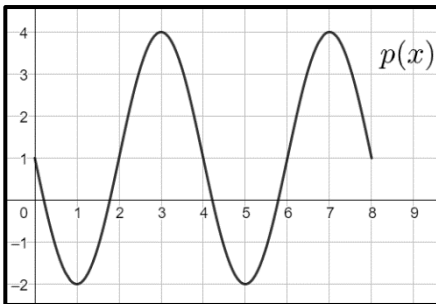**Directions**: Find the average rate of change for the following functions on the given intervals. Show all work.

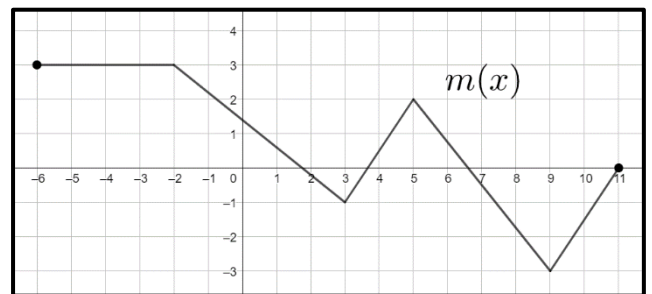1. $f(x) = x^2 - x$ on $[-2, -1]$

2. $g(x) = 4x + 7$ on $[2, 5]$

3. $h(x) = \sqrt{4x + 1}$ on $[2, 12]$

4. $k(x) = \dfrac{x + 1}{x - 3}$ on $[4, 10]$

5. $p(x)$ on $[1, 6]$

6. $m(x)$ on $[-2, 9]$

x	-3	1	4	8
$f(x)$	0	-2	7	3

7. Selected values for the function $f(x)$ are shown in the table above. Find the average rate of change for $f(x)$ from $x = 1$ to $x = 8$.

8. Let $n(x) = x^2 - 4$. The average rate of change of $n(x)$ over the interval $[c, 5]$ is equal to 3, where c is a constant. Find the value of c.

Annual Budgets for Different Programs in Kansas, 2007 to 2010

Program	Year			
	2007	2008	2009	2010
Agriculture/natural resources	373,904	358,708	485,807	488,106
Education	2,164,607	2,413,984	2,274,514	3,008,036
General government	14,347,325	12,554,845	10,392,107	14,716,155
Highways and transportation	1,468,482	1,665,636	1,539,480	1,773,893
Human resources	4,051,050	4,099,067	4,618,444	5,921,379
Public safety	263,463	398,326	355,935	464,233

The table above lists the annual budget, in thousands of dollars, for each of six different state programs in Kansas from 2007 to 2010.

9. Which of the following best approximates the average rate of change in the annual budget for agriculture/natural resources in Kansas from 2008 to 2010?

A) $50,000,000 per year

B) $65,000,000 per year

C) $75,000,000 per year

D) $130,000,000 per year