

Name _____

Homework 18

Section 5.3

1. (6) What is the average value of the function $g(x) = \sqrt{16 - x^2}$ on the interval $[-4, 4]$?
Give an exact answer. Hint: geometry?

2. (6) Given $g(x) = \sin(x^2)$, use the Fundamental Theorem of Calculus to find $\int_{-\sqrt{\frac{\pi}{2}}}^{\sqrt{2\pi}} g'(x) dx$.

3. (8) Suppose $f(x)$ is a continuous function. Let $A_{[a,b]}$ denote the average value of $f(x)$ on the interval $[a, b]$. Show that $A_{[0,15]}$ is equal to the average of $A_{[0,5]}$, $A_{[5,10]}$, and $A_{[10,15]}$. That is, write out the average of $A_{[0,5]}$, $A_{[5,10]}$, and $A_{[10,15]}$ and show that it is the same as $A_{[0,15]}$. *Note that you will need to use a property of definite integrals from section 5.4.*