

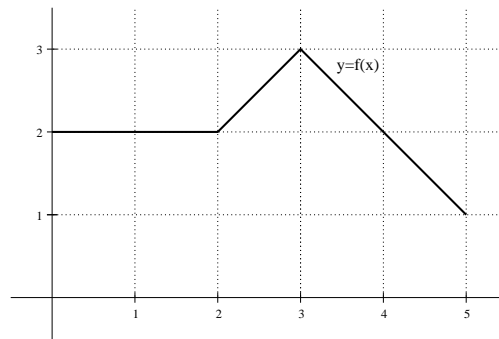
Name _____

Quiz Section _____

In this worksheet, we explore the Fundamental Theorem of Calculus and applications of the Area Problem to problems involving distance and velocity. We also consider integrals involving net and total change.

FTC Practice

1 Let $f(x)$ be given by the graph to the right and define $A(x) = \int_0^x f(t) dt$. Compute the following.



$A(1) =$ _____ $A(2) =$ _____

$A(3) =$ _____ $A(4) =$ _____

$A'(1) =$ _____ $A'(2) =$ _____

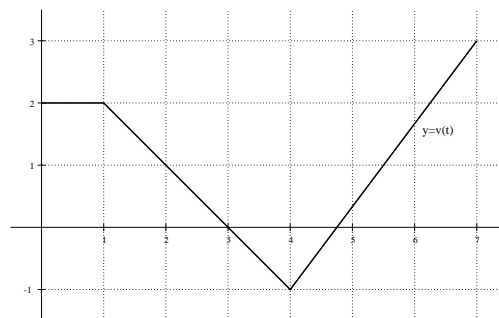
$A'(3) =$ _____ $A'(4) =$ _____

The maximum value of $A(x)$ on the interval $[0, 5]$ is _____

The maximum value of $A'(x)$ on the interval $[0, 5]$ is _____

Velocity and Distance

2 A toy car is travelling on a straight track. Its velocity $v(t)$, in m/sec, be given by the graph to the right. Define $s(t)$ to be the position of the car in meters. Choose coordinates so that $s(0) = 0$. Compute the following.



$s(2) =$ _____ $s(4) =$ _____ $s(6) =$ _____

$v(2) =$ _____ $v(4) =$ _____ $v(6) =$ _____

The maximum value of $s(t)$ on the interval $[0, 7]$ is _____

The minimum value of $s(t)$ on the interval $[0, 7]$ is _____

The maximum value of $v(t)$ on the interval $[0, 7]$ is _____

The minimum value of $v(t)$ on the interval $[0, 7]$ is _____

Net and Total Change

3 (a) Evaluate $\int_{-2}^2 |x^2 - 4| dx$ and $\left| \int_{-2}^2 (x^2 - 4) dx \right|$ and explain your answers.

(b) Now evaluate $\int_{-3}^3 |x^2 - 4| dx$ and $\left| \int_{-3}^3 (x^2 - 4) dx \right|$ and explain your answers.

Another Area Problem

4 An artist you know wants to make a figure consisting of the region between the curve $y = x^2$ and the x -axis for $0 \leq x \leq 3$

(i) Where should the artist divide the region with a vertical line so that each piece has the same area? (See the picture.)

(ii) Where should the artist divide the region with vertical lines to get 3 pieces with equal areas?

