## Indefinite Integrals

1. For each, classify the answer as a family of functions or a number and then find it.
$\int_{0}^{1} e^{2}-2^{u} d u$
$\int \frac{t^{6}-t^{4}+2 t}{t^{4}} d t$
2. A honeybee population starts with 100 bees and increases at a rate of $n^{\prime}(t)$ bees per week. What does $100+\int_{0}^{15} n^{\prime}(t) d t$ represent?
3. The velocity function (in meters per second) is given for a particle moving along a line by the function $v(t)=3 t-5$.
(a) What are the units of $\int_{0}^{3} v(t) d t$ ?
(b) Find the net change (displacement) between 0 and 3 seconds.
(c) Find the total distance traveled between 0 and 3 seconds.

## The Other FTC

1. Consider the graph of $g$ below. Let $G(x)=\int_{0}^{x} g(t) d t$.
(a) Find $G(0)$
(b) Find $G(1)$


(d) Collect enough points to sketch a graph of $G$
2. For each function $F$ defined below, find $F^{\prime}$.

$$
F(x)=\int_{3}^{x} 2 t-2^{t} \ln (2) d t
$$

$$
F(x)=\int_{0}^{\tan (x)} \sqrt{t+\sqrt{t}} d t
$$

