30 November 2018

1. 5 Let $f(x)$ be $2 \pi$-periodic with one period given by $f(x)=x$ for $x \in[-\pi, \pi)$. Find the Fourier coefficients, $a_{0}, a_{n}$, and $b_{n}$, for $f(x)$.
2. Consider the parametric curve given by

$$
\begin{aligned}
& x=4 t-3 \\
& y=2-3 t
\end{aligned}
$$

(a) 1 Find the arc length for $t \in[0,3]$.
(b) 1 Find $\frac{d x}{d t}$ at $t=5$.
(c) 1 Find $\frac{d y}{d t}$ at $t=-7$.
(d) 1 Find the slope $\frac{d y}{d x}$ at $t=3$.
(e) 1 Find the speed $\frac{d s}{d t}$ at $t=2$.

