Math 1700 Extra problems for section 6.4

Find the area bounded between $f(x)$, $a \le x \le b$, and the x-axis.

1)
$$\vec{v}(t) = \begin{pmatrix} 1/t \\ t \\ 1/2t \end{pmatrix}, \qquad \vec{r}(0) = \begin{pmatrix} 0 \\ 1 \\ -1 \end{pmatrix}.$$

2) $f(x) = 1/x$, $a = 1$, $b = 3$

3) $f(x) = e^x$, $a = 0$, $b = 2$

4) $f(x) = e^{-x}$, $a = 0$, $b = 2$

5) Find the are swept out by
$$\vec{r}(t) = 2e^t\,(\cos(t), \sin(t)), \qquad 0 \le t \le \pi.$$