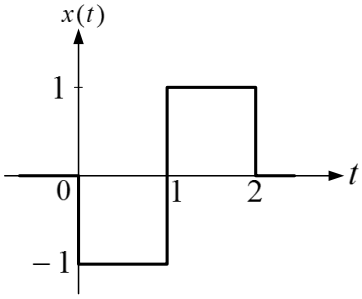
EE 362: Signals and Systems Name:

Spring 2019

Homework #6 (Due: Thursday, March 7, 2019)

- Circle or box your answer (don't forget units).
- **Show** your steps.
- Use 8.5" x 11" paper, and trim off any ragged edges.
- **Staple** your work together and write your name neatly.

(1) Use Fourier properties to compute the Fourier transform of the following signal. [6 points]



(2) A continuous-time signal $x(t)$ has Fourier transform

$$X(\omega) = \frac{1}{j\omega + b}$$

where b is a constant. Determine Fourier transform $V(\omega)$ of the following signals: [2 points each; 10 points total]

(a) $v(t) = x(2t)$
(b) $v(t) = tx(t)$
(c) $v(t) = e^{-j10t}x(t)$
(d) $v(t) = x(t)\sin(15t)$
(e) $v(t) = x(t+3)$

(3) A signal has Fourier transform as, [6 points]

$$X(\omega) = \frac{1}{j}\left[\text{sinc}\left(\frac{2\omega}{\pi} - \frac{1}{2}\right) - \text{sinc}\left(\frac{2\omega}{\pi} + \frac{1}{2}\right)\right]$$

Compute $x(t)$