PROBLEM:

For each of the following problems, **SIMPLIFY** your answer as much as possible.

(a) Evaluate
$$\Im m\{x[n]x^*[n-1]\}$$
 when $x[n] = e^{j(0.1)\pi n}$.

(b) Evaluate the following expression,
$$|e^{j\pi/6} - e^{-j\pi/6}| =$$

(c) Evaluate the following integral,
$$\int_{-\infty}^{t} \delta(\tau - 7) \sin(\tau) e^{-j\pi\tau/2} d\tau$$

(d) Evaluate the following integral,
$$\int_{-\infty}^{\infty} e^{-5t} u(t) e^{-j\omega t} dt$$
.

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For each of the following problems, **SIMPLIFY** your answer as much as possible.

(a) Evaluate $\Im m\{x[n]x^*[n-1]\}$ when $x[n] = e^{j(0.1)\pi n}$.

=
$$lm \{ e^{j(0.1)\pi n} e^{-j(0.1)\pi(n-1)} \}$$

= $lm \{ e^{j(0.1)\pi} \} = sin(0.1\pi)$

(b) Evaluate the following expression, $|e^{j\pi/6} - e^{-j\pi/6}| =$

(c) Evaluate the following integral, $\int_{-\infty}^{t} \delta(\tau - 7) \sin(\tau) e^{-j\pi\tau/2} d\tau$ $\sin(7)e^{-j\pi^{7/2}} = j\sin(7)$ $= j\sin(7)\int_{-\infty}^{\infty} \delta(2-7) d2$

(d) Evaluate the following integral, $\int_{-\infty}^{\infty} e^{-5t} u(t) e^{-j\omega t} dt$.

THIS IS THE FOURIER TRANSFORM OF estult)

$$\therefore ANS = \frac{1}{5+j\omega}$$