Sheet 1
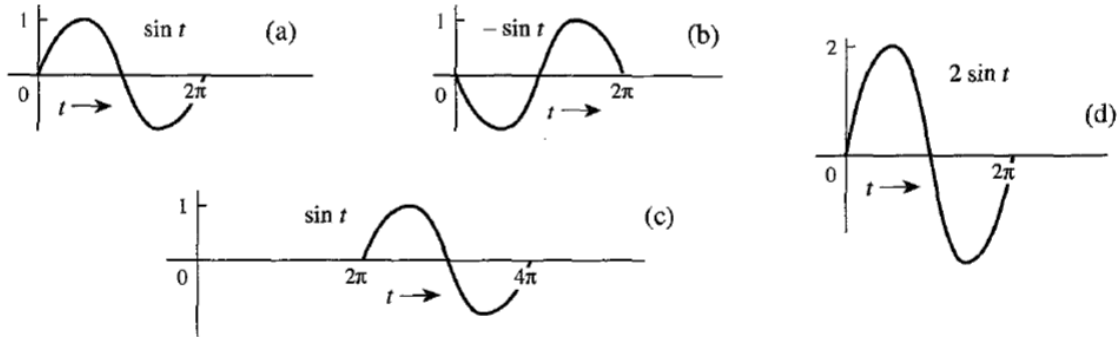
1. Find the energies of the signals shown in fig. Comment on the effect on energy of sign change, time shifting, or doubling of the signal.

2. Determine the power value for each of the following signals.

(a) $10 \cos \left(100t + \dfrac{\pi}{3}\right)$

(b) $10 \cos \left(100t + \dfrac{\pi}{3}\right) + 16 \sin \left(150t + \dfrac{\pi}{5}\right)$

(c) $(10 + 2 \sin 3t) \cos 10t$

(d) $10 \cos 5t \cos 10t$

(e) $10 \sin 5t \cos 10t$

(f) $e^{j\alpha t} \cos \omega_0 t$

Q3: State whether the following statements is true or false:

1. Amplitude is the maximum value of a signal, measured from its average state.

2. Frequency is the force which moves an electrical current against resistance.

3. Frequency is the number of cycles produced in a second.

4. All decimal values can be represented by binary.

5. Channel bandwidth is the range of signal bandwidths allowed by a communication channel with significant loss of energy (attenuation).

6. Increasing signal power increases the effect of channel noise, and the information is received more accurately.

7. A larger signal-to-noise ratio (SNR) also allows transmission over a longer distance.

8. Amplification of the received signal to make up for the attenuation is the right choice.

9. External noise can be minimized or even eliminated while internal noise can be reduced but can never be eliminated.

10. A signal rich in content have smaller bandwidth than a signal that is dull or varies very slowly.