

1. Find $x(t) * u(t)$

Select one:

- ☐ a. integration of $x(t)$ from 0 to ∞
- ☐ b. $t x(t)$
- ☒ c. integration of $x(t)$ from $-\infty$ to 0
- ☐ d. $2 t x(t)$

Feedback : The correct answer is: integration of $x(t)$ from $-\infty$ to 0

2. $y(t) = x(t-2) + x(2-t)$. Comment on its causality:

Select one:

- ☐ a. All of the mentioned
- ☐ b. Time variant
- ☐ c. Causal
- ☒ d. Non causal

Feedback

The correct answer is: Non causal

3. Comment on the causality of $y[n] = n * x[n]$.

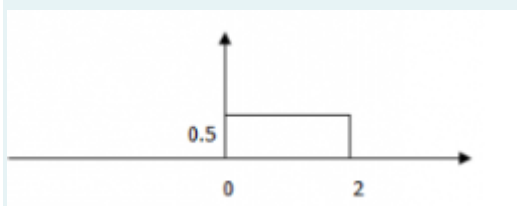
Select one:

- ☐ a. Time invariant
- ☐ b. Time varying
- ☐ c. Non causal
- ☒ d. Causal

Feedback

The correct answer is: Causal

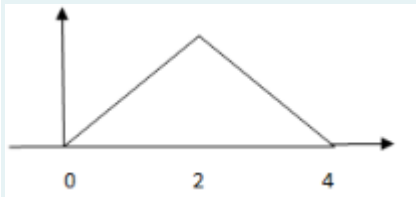
4. Convolve given $x(t)$ with itself and choose the correct output.



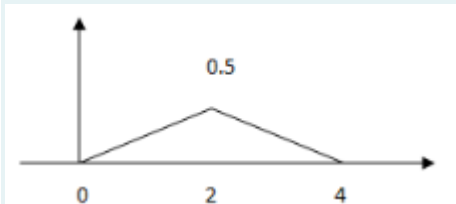
Select one:



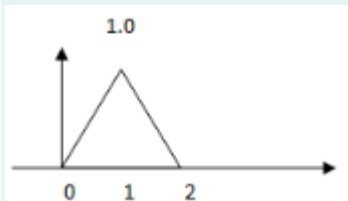
a.



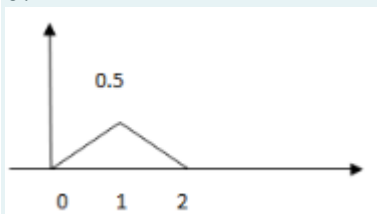
b.



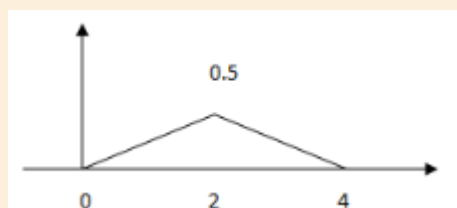
c.



d.



Feedback



The correct answer is:

5. For what value of k , will the following system be time invariant? $y(t) = x(t) + x(kt) - x(2t) + x(t-1)$

Select one:



a. 1



b. 3

- ☒ c.2
- ☐ d.2.5

Feedback

The correct answer is: 2

6.We have to do the following steps in order on $g(t)$ to sketch $g(2t-1)$:

Select one:

- ☐ a. shift by 1 to the left, then time compress by 2
- ☐ b. shift by 1 to the left, then time expand by 2
- ☐ c. shift by 1 to the right, then time expand by 2
- ☒ d. shift by 1 to the right, then time compress by 2

Feedback

The correct answer is: shift by 1 to the right, then time compress by 2

7.Determine the nature of the system: $y(n)=x(-n)$.

Select one:

- ☐ a. Causal
- ☒ b. Non-causal
- ☐ c. Causal for all positive values of n
- ☐ d. Non-causal for negative values of n

Feedback

The correct answer is: Non-causal

8.Find the value of $h[n]*d[n+1]$, $d[n]$ being the delta function.

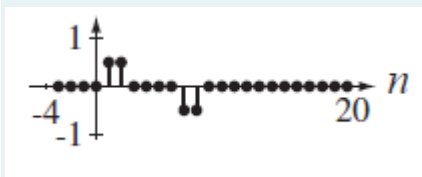
Select one:

- ☐ a. $h[n-2]$.
- ☐ b. $h[n]$.
- ☒ c. $h[n+1]$.
- ☐ d. $h[n-1]$.

Feedback

The correct answer is: $h[n+1]$.

9.If $y[n]$ is the accumulation of the signal given bellow, $y[5]=$



Select one:

- ☐ a. None of the given options
- ☐ b. 0
- ☐ c. 2
- ☐ d. 0.5
- ☒ e. 1

Feedback

The correct answer is: 1

10.The value of the following is:

$$\int_0^4 \delta_3(2t - 1) dt$$

Select one:

- ☐ a. None of the given options
- ☐ b. 0.5
- ☐ c. 1
- ☒ d. 1.5

The correct answer is: 1.5

11. An odd function described over the time $t > 0$ as follows:

$$x(t) = 0, \quad 0 \leq t < 5$$

$$= 3-7t, \quad 5 \leq t < 10$$

$$= 0, \quad t \geq 10$$

The derivative of the function at $t = -8$ is equals to:

Select one:

- ☐ a. -4

- ☒ b. None of the given options
- ☐ c.-7
- ☐ d.4
- ☐ e.7

Feedback

The correct answer is: -7

12. The energy of the signal $x[n] = \delta[n] + 3\delta[n - 3]$ is:

Select one:

- ☒ a. None of the given options
- ☐ b.4
- ☐ c.9
- ☐ d.16
- ☐ e.1

Feedback

The correct answer is: None of the given options

13.The discrete-time unit-impulse function suffers from the mathematical peculiarities that the continuous-time unit impulse has.

Select one:

- ☐ True
- ☒ False

Feedback

The correct answer is 'False'.

14.Evaluate $(\exp(-at)u(t)) * d(t)$, $d(t)$ being the unit impulse.

Select one:

- ☐ a. $(1 - \exp(-at)) u(t)$
- ☒ b. $\exp(-at) u(t)$
- ☐ c. $(1 + \exp(-at)) u(t)/a$
- ☐ d. $(1 - \exp(at)) u(-t)/a$

Feedback

The correct answer is: $\exp(-at) u(t)$

15. Determine the nature of the system: $y[n] = x[n]x[n - 1]$ with unit impulse function as an input.

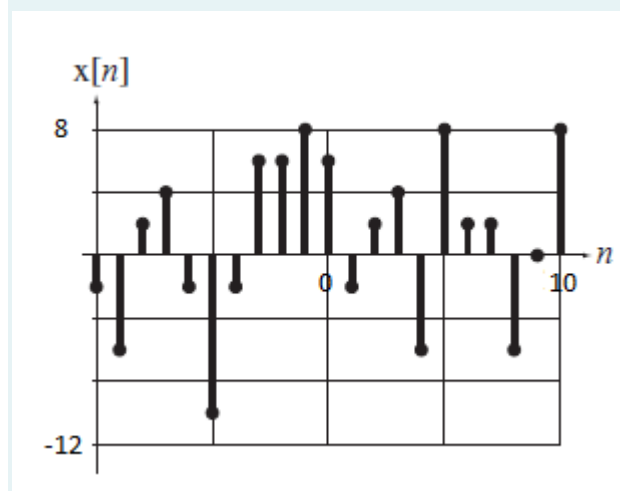
Select one:

- ☐ a. Static, output always zero, non-invertible
- ☒ b. Dynamic, output always zero, non-invertible
- ☐ c. Dynamic, output always 1, invertible
- ☐ d. Dynamic, output always 1, invertible

Feedback

The correct answer is: Dynamic, output always zero, non-invertible

16. If $y[n]$ is the first forward difference of $x[n]$ given below, $y[5] =$



Select one:

- ☒ a. -6
- ☐ b. 7
- ☐ c. 14
- ☐ d. 2
- ☐ e. None of the given options

Feedback

The correct answer is: -6

17. The numerical value of the following function is:

Answer:

Feedback

The correct answer is: 0

18. Find the value of $h[n]*d[n-5]$, $d[n]$ being the impulse function.

Select one:

- ☐ a. $d[n-4]$.
- ☐ b. $d[n-5]$.
- ☒ c. $h[n-5]$.
- ☐ d. $h[n-4]$.

Feedback

The correct answer is: $h[n-5]$.

19. If the backward difference of the signal $f[n]$ is given by:

"an image is missing"

Then, $f[5]=$

Select one:

- ☐ a. -1
- ☐ b. 5
- ☐ c. 0
- ☒ d. 1

Feedback

The correct answer is: 1

19. The even part of the functions $x(t) = 5t^3 + 4t^2 - 2t + 7$ is:

Select one:

- ☐ a. $2t^2 + 6$
- ☐ b. $5t^3 + 4t^2 - 2t + 7$
- ☐ c. None of the given options
- ☐ d. $7 - 4t^2$
- ☒ e. $4t^2 + 7$

Feedback

The correct answer is: $4t^2 + 7$

- The forward and backward difference of a signal give the same result.

Select one:

True

False

Feedback

The correct answer is 'False'.

- If h_1 , h_2 and h_3 are cascaded, and $h_1 = u(t)$, $h_2 = d(t)$ and $h_3 = d(t)$, find the overall impulse response Select one:

a. $u(t)$

b. $s(t)$

c. $d(t)$

d. all of the mentioned

Feedback

The correct answer is: $u(t)$

The signal $x[n] = 5 \cos(\pi(n-1)/4)$ is a DT even signal.

Select one:

True

False

Feedback

The correct answer is 'False'.

- Compute $u(t)$ convolved with itself? Select one:

a. $y(t) = u(t)$

b. $y(t) = t^2 \cdot u(t)$

c. $y(t) = t \cdot u(t)$

d. $y(t) = t \cdot u(t-1)$

Feedback

The correct answer is: $y(t)=t.u(t)$

- The value of the function $\text{sgn}(-9) \text{rect}(-1/4)$ is:

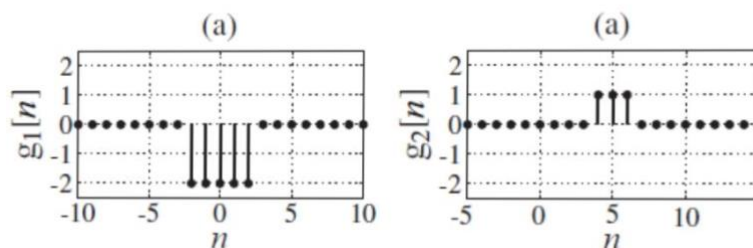
Answer: -1

Feedback

The correct answer is: -1

- The relation between $g_2[n]$ and $g_1[n]$ is given by:

The relation between $g_2[n]$ and $g_1[n]$ is given by:



a. $g_2[n] = -0.5g_1[2n]$

b. $g_2[n] = -2g_1[2n-5]$

c. None of the given options

d. $g_2[n] = -0.5g_1[2(n-5)]$

e. $g_2[n] = -0.5g_1[2n-5]$

Feedback

The correct answer is: None of the given options

- For what value of k , will the following system be time invariant? $y(t) = x(t) + x(kt) - x(2t) + x(t-1)$
1) Select one:

a.

2.5

b. 2

c. 1

d. 3

Feedback

The correct answer is: 2

If h_1 , h_2 and h_3 are cascaded, and $h_1 = u(t)$, $h_2 = \exp(t)$ and $h_3 = \sin(t)$, find the overall impulse response Select one: •

a.all of the mentioned

b. $\sin(t) * \exp(t) * u(t)$

c. $u(t) * \sin(t)$

d. $\sin(t) + \exp(t) + u(t)$

Feedback

The correct answer is: $\sin(t) * \exp(t) * u(t)$

• The energy of the signal $x[n] = \delta[n] + 3\delta[n-3]$ is:

Select one:

a.4

b.1

c.9

d.None of the given options

e.16

Feedback

The correct answer is: None of the given options

• In a continuous-time physical system, memory is directly associated with _____ Select one:

a.Number of components in the system

b.Storage of energy

c.Registers

d.Time

Feedback

The correct answer is: Storage of energy

Comment on the linearity of $y[n] = n \cdot x[n]$. Select one: •

- a. Not scalable
- b. Linear
- c. Non linear
- d. Only additive

Feedback

The correct answer is: Linear

• The numerical value of the following function is:

$$4 \int_0^{20} \delta_4(t-2) \text{rect}(t) dt$$

Answer: 0

Feedback

The correct answer is: 0

• Find the value of $h[n] \cdot d[n-5]$, $d[n]$ being the impulse function. Select one:

- a. $d[n-4]$.
- b. $h[n-4]$.
- c. $h[n-5]$.
- d. $d[n-5]$.

Feedback

The correct answer is: $h[n-5]$.

- The value of the following is:

$$\int_0^4 \delta_3 (2t - 1) dt$$

Select one:

- a. 1.5
- b. 0.5
- c. 1
- d. None of the given options

The correct answer is: 1.5

- $y(t) = \int x(t) dt$, integration from 0 to t. Is the system a memoryless one? Select one:

- a. Both memoryless and having memory
- b. None of the Mentioned
- c. Yes
- d. No

Feedback

The correct answer is: No

• The area of the following function is:

$\delta(-2(t - 7))$ Select one:

- a. 0
- b. $1/2$
- c. 2
- d. $7/2$

Feedback

The correct answer is: $1/2$

• Find the value of $d(t-34)*x(t+56)$, $d(t)$ being the delta function. Select one:

- a. $x(t + 56)$
- b. $x(t + 32)$
- c. $x(t - 22)$
- d. $x(t + 22)$

Feedback

The correct answer is: 7

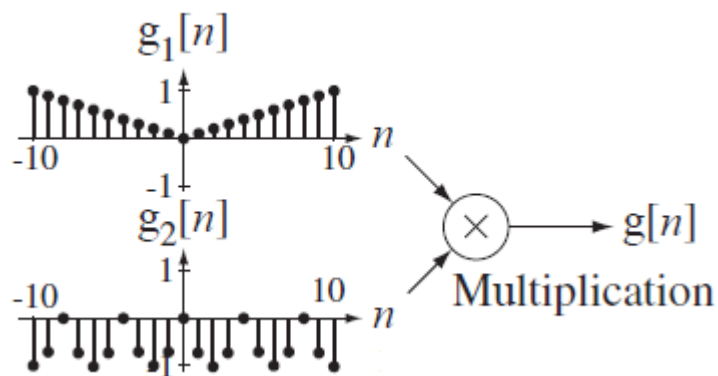
• $y(t) = x(t-2) + x(2-t)$. Comment on its causality: Select one:

- a. Causal
- b. Time variant
- c. All of the mentioned
- d. Non causal

Feedback

The correct answer is: Non causal

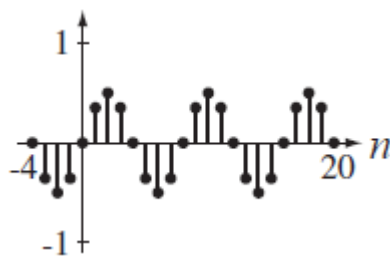
- The result of the following multiplication $g[n]$ is:



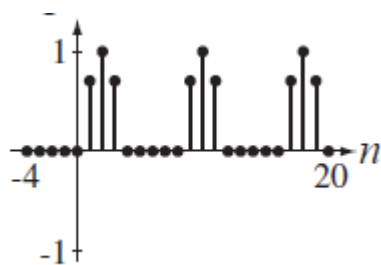
Select one:

- a. None of the given options.

b.



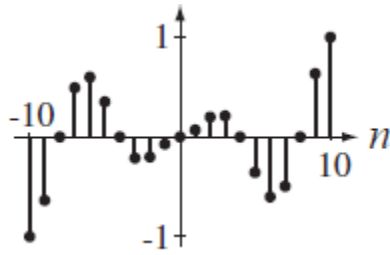
c.



d.



e.



Feedback

The correct answer is: None of the given options

- Which one of the following is an example of a system with memory?

Accumulator

- The impulse response $h(t)$ of an LTI system is given by $e^{-2t}u(t)$. What is the step response?

$y(t) =$

$\frac{1}{2}(1 - e^{-2t})u(t)$

- Comment on the linearity of $y[n] = n \cdot x[n]$.

Linear

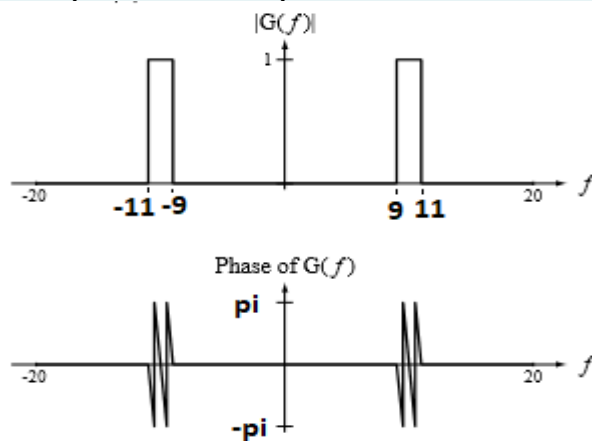
- The following signal is: $g(t) = \cos(\pi^2 t) + \sin(2\pi^2 t/3)$

periodic with period $6/\pi$

- If h_1 , h_2 and h_3 are cascaded, find the overall impulse response

$h_1 * h_2 * h_3$

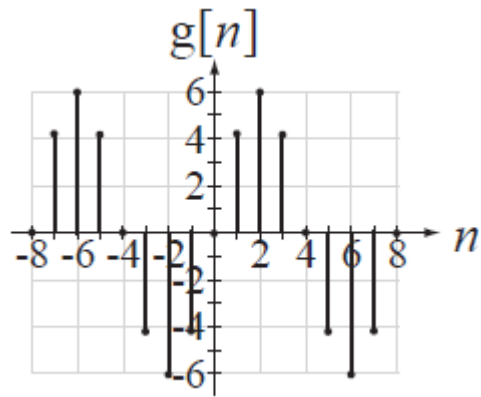
- The complex function expression for the following magnitude and phase is:



$\{\text{rect}[(f-10)/2] + [\text{rect}(f+10)/2]\}e^{-j2\pi f}$

- The average power of the following periodic signal is:

- e.0



- 1

- NO

-

1

-

13. Is the system time invariant: $y(t) = x(4t)$?

NO

14. It does not matter which one we shift, the input signal or the unit impulse response of a system during linear convolution in an integral.

True

15. The following signal is periodic:

$$g(t) = 3 \sin(5t) + 4\sin(\sqrt{2} t)$$

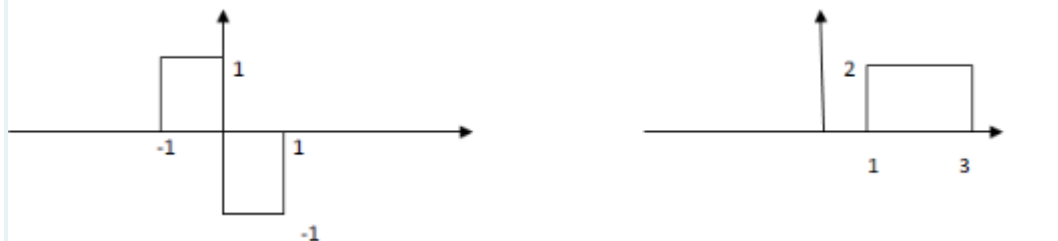
False

16. The period of the following signal is :

$$g[n] = \sin(10\pi n/3)$$

3 -> بتطلع 3/5 بس بالاجابة النموذجية 3

17. Make the convolution of the following signals, and determine the correct answer:



$$Y(0) = 0, y(1) = 2, y(3) = -2$$

18. Which of the following systems is BIBO stable?

$$y(t) = 2 \sin(x(t))$$

19. The following function is equal to the following:

$$g(t) = \int_{-\infty}^t [\delta(\lambda) - \delta(\lambda - 1)] d\lambda$$

$$\text{rect}(t-0.5)$$

20. If h_1 , h_2 and h_3 are parallely summed, find the overall impulse response

$$h_1 + h_2 + h_3$$

If the backward difference of the signal $f[n]$ is given by:



Then, $f[5]=$

Select one:

- a. 0
- b. 1
- c. -1
- d. 5

Feedback

The correct answer is: 1

Find the value of $h[n]*d[n+1]$, $d[n]$ being the delta function.

Select one:

- a. $h[n+1]$.
- b. $h[n]$.
- c. $h[n-1]$.
- d. $h[n-2]$.

Feedback

The correct answer is: $h[n+1]$.

The energy of the odd part of an even signal is zero

Select one:

- True
- False

The correct answer is 'True'

$y(t)=\int x(t) dt$, integration from 0 to t. Is the system a memoryless one?

Select one:

- a. None of the Mentioned
- b. Both memoryless and having memory
- c. No

d. Yes

Feedback

The correct answer is: No

$y(t) = \sin(x(t-1))$: Comment on its memory aspects.

Select one:

a. Time invariant system

b. Having no memory

c. Memoryless system

d. Having memory

Feedback

The correct answer is: Having memory

Compute $u(t)$ convolved with itself?

Select one:

a. $y(t) = t \cdot u(t-1)$

b. $y(t) = u(t)$

c. $y(t) = t \cdot u(t)$

d. $y(t) = t^2 \cdot u(t)$

The correct answer is: $y(t) = t \cdot u(t)$

Which of the following systems is time invariant?

Select one:

a. $y(t) = x(t) + x(1-t)$

b. $y(t) = -x(t) + x(1-t)$

c. $y(t) = x(2t) + x(t)$

d. $y(t) = x(t) + x(t-1)$

The correct answer is: $y(t) = x(t) + x(t-1)$

A system is said to be linear if _____

Select one:

a. It satisfies both amplitude scaling and principle of superposition theorem

b.

It satisfies amplitude scaling but not the principle of superposition theorem

c. It satisfies only amplitude scaling

d. It satisfies only the principle of superposition theorem

The correct answer is: It satisfies both amplitude scaling and principle of superposition theorem

The discrete-time unit-impulse function suffers from the mathematical peculiarities that the continuous-time unit impulse has.

Select one:

True

False

Feedback

The correct answer is 'False'.

Find the value of $h[n]*d[n-1]$, $d[n]$ being the delta function.

Select one:

a. $h[n-1]$.

b. $h[n+1]$.

c. $h[n]$.

d. $h[n-2]$.

Feedback

The correct answer is: $h[n-1]$

It does not matter which one we shift, the input signal or the unit impulse response of a system during linear convolution in an integral.

Select one:

a. True

b. False

Feedback

The correct answer is: True

The signal $x[n] = 7 \sin(n/3)$ is periodic

Select one:

True

False

Feedback

The correct answer is 'False'

A system with memory which anticipates future values of input is called _____

Select one:

- a. Non-causal System
- b. Causal System
- c. Static System
- d. Non-anticipative System

Feedback

The correct answer is: Non-causal System

An inverse system connected with the original system gives an output equal to the input. How is the inverse system should be connected to the original system?

Select one:

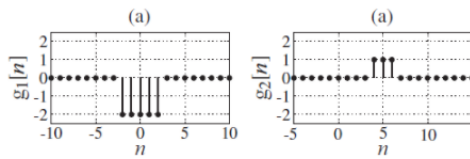
- a. Cascaded
- b. No connection
- c. Not connected
- d. parallel

Feedback

The correct answer is: Cascaded

The relation between $g_2[n]$ and $g_1[n]$ is given by:

The relation between $g_2[n]$ and $g_1[n]$ is given by:



Select one:

a. None of the given options

b. $g_2[n] = -0.5g_1[2(n-5)]$

c. $g_2[n] = -2g_1[2n-5]$

d. $g_2[n] = -0.5g_1[2n]$

e. $g_2[n] = -0.5g_1[2n-5]$

Feedback

The correct answer is: None of the given options

The following signal is odd:

$$g(t) = 12 + \sin(4t)/4t$$

Select one:

True

False

Feedback

The correct answer is 'False'.

Comment on the linearity of $y[n] = n \cdot x[n]$.

Select one:

- a. Linear
- b. Only additive
- c. Non linear
- d. Not scalable

Feedback

The correct answer is: Linear

The value of the function $\text{sgn}(-9) \text{rect}(-1/4)$ is:

Feedback

The correct answer is: -1

The following signal is periodic:

$$g(t) = 3 \sin(5t) + 4 \sin(\sqrt{2} t)$$

Select one:

- True
- False

Feedback

The correct answer is 'False'.

State whether the differentiator system is a stable system or not.

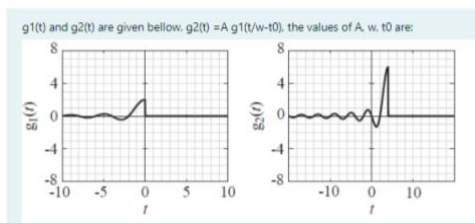
Select one:

- a. True

b. False

Feedback: The correct answer is: False

$g_1(t)$ and $g_2(t)$ are given below. $g_2(t) = A g_1(t/w - t_0)$, the values of A , w , t_0 are:



Select one:

a. None of the given options

b. $A=3$, $w=1/2$, $t_0=4$

c. $A=3$, $w=2$, $t_0=4$

d. $A=3$, $w=2$, $t_0=2$

Feedback

The correct answer is: $A=3$, $w=1/2$, $t_0=4$

Which among the following is an invertible system?

Select one:

a. $y(t)$ = the square of $x(t)$

b. $y[n] = 6$

c. $y[n] = 5x[n]$

d. $y(t) = dx(t)/dt$

Feedback

The correct answer is: $y[n] = 5x[n]$

If h_1 , h_2 and h_3 are cascaded, and $h_1 = u(t)$, $h_2 = \exp(t)$ and $h_3 = \sin(t)$, find the overall impulse response

Select one:

a. $u(t)*\sin(t)$

b. all of the mentioned

c. $\sin(t) + \exp(t) + u(t)$

d. $\sin(t)*\exp(t)*u(t)$

Feedback

The correct answer is: $\sin(t)*\exp(t)*u(t)$

If $h[n] = g[3n]$, and $g[n] = u[n-1] - u[n-8]$, what is the sum of all the values of $h[n]$

Select one:

a. None of the given options

b. 1

c. 3

d. 7

e. 7/3

Feedback

The correct answer is: None of the given options

the complex number $(9-j6)$ in polar form is:

Select one:

- a. $10.8 \angle 33.7$
- b. $3.9 \angle -33.7$
- c. $3.9 \angle 33.7$
- d. $10.8 \angle -33.7$

Feedback

The correct answer is: $10.8 \angle -33.7$

If h_1 , h_2 and h_3 are cascaded, find the overall impulse response

Select one:

- a. $h_1 + h_2 + h_3$
- b. h_3
- c. all of the mentioned
- d. $h_1 * h_2 * h_3$

Feedback

The correct answer is: $h_1 * h_2 * h_3$

The average power of the following periodic signal is:

☐ a. 0

☐ b. None of the given options

☒ c. 19.4

☐ d. 3.5

☐ e. 136

If the backward difference of the signal $f[n]$ is given by:

Select one:

☐ a. 5

☐ b. 1

☒ c. -1

☐ d. 0

Find the value of $d(t-34)*x(t+56)$, $d(t)$ being the delta function.

d. $x(t + 22)$

The value of the even part of the following signal at $n = 5$ is:

c.6

d.2

Feedback

The correct answer is: 3

Find the value of $h[n-1]*d[n-1]$, $d[n]$ being the delta function.

Select one:

- a. $h[n]$.
- b. $h[n-2]$.
- c. $h[n+1]$.

d. $h[n-1]$.

Feedback

The correct answer is: $h[n-2]$.