AV Math Practice Test

Instructions

Solve the following AV math problems. Then, check your answers using the key on page 5. If you miss 5 or more questions, you should complete *GEN104 AV Math Online* before enrolling in *DES212* or higher (including *DES314 CTS-D Prep*) or challenging any of the three CTS exams.

1. A company requires a 1.33:1 screen to be installed in a room. The existing projector in the room is configured to project an image that is 44.3 inches (1125 mm) high and 59 inches (1499 mm) wide. What is the aspect ratio of the projected image?

2. A screen is 125 inches (3175 mm) wide and the throw ratio is 2.3:1. How far from the screen should the projector be placed?

3. The farthest viewer is 240 inches (6096 mm) away from the screen. The audience is performing detailed tasks. What is the height of the image?

4. The farthest viewer is 480 inches (12192 mm) away from the screen. The audience is performing general tasks. What is the height of the image?

5. There are four loudspeakers wired in parallel. Two of the loudspeakers each have an impedance of 8 ohms. Two of the loudspeakers each have an impedance of 16 ohms. Calculate the impedance of this parallel circuit.

6. In an auditorium, 75 dB_{SPL} is measured at a location. At a second location, 69 dB_{SPL} is measured. How much farther away from the source is the second location from the first location?

7. If the measured current in a circuit is 5 A and the resistance is 8 ohms, what is the voltage?

8. If the measured current is 10 A and the voltage is 120 V, what is the resistance in the circuit?

9. If you are going to run two cables inside a conduit, these two cables may occupy up to ____ percent of the conduit's inside area.

10. A presenter is playing a music CD from her laptop for two people in a room. Listener A is 6.56 feet (2 m) away from the presenter. Listener B is 49.21 feet (15 m) away from the presenter. What is the difference in SPL between listener A and listener B?

11. You need a projected image to fill the custom sized space above the chair rail in a room. You measure and find the height to be 63 inches (1600.2 mm). What is the width of a screen with this height and a 4:3 aspect ratio?

12. You are upgrading an existing room and need to determine the farthest viewer's distance from the new screen. Screen height is 4.92 feet (1.5 m), and the client will be using the screen for spacecraft technical drawings.

13. Using a display resolution of 1280 pixels by 1024 pixels and a refresh rate of 60Hz, calculate the total amount of signal bandwidth required.

14. In your meeting room you are using a list of devices totaling 210 watts when idling. What is the total BTUs?

15. Assume a loudspeaker is generating 82 dB_{SPL} at a distance of 12 feet (3700 mm) away from the source outdoors. What would the level be at 27 feet (8200 mm) away?

16. The screen's height is 54 inches (1372 mm), and the audience will be watching movies. How far away is the farthest viewer?

17. If the measured power in a circuit is 5W, and the current is 1.5 amps, what is the voltage?

18. Determine the wattage in a circuit measuring 120 volts with 15 amperes of current flow.

19. In a meeting room is a listener 120 inches (3048 mm) from a loudspeaker. If the listener moves to a new distance of 300 inches (7620 mm) away, what is the expected change in decibels?

20. Text height is 3.2 inches (81 mm). Determine the maximum distance of the viewer.

Answer Key

1.	1.33:1 (4:3)
2.	287.5 inches (7303 mm)
3.	40 inches (1016 mm)
4.	60 inches (1524 mm)
5.	2.7 ohms
6.	Twice as far away
7.	40 V
8.	12 ohms
9.	31
10.	-17.5 dB
11.	84 inches (2128.27 mm)
12.	19.68 feet (6 m)
13.	117.96 MHz
14.	714 BTUs
15.	75 dB_{SPL}
16.	432 inches (10976 mm)
17.	3.3 V
18.	1800W
19.	-7.96 dB

20.	480 inches (12150 mm)