

### Answer on Question#52046 - Physics - Mechanics

If  $s$  is distance and  $t$  is time, what must be the dimensions of  $a$  and  $b$  in the equation  $s = a \sin(bt)$ ?

$$[a]=[L]^{-1}, [b]=[L]^{-1}$$

$$[a]=[T]^{-1}, [b]=[L]$$

$$[a]=[L], [b]=[T]^{-1}$$

$$[a]=[L]^2, [b]=[T]^{-2}$$

Solution:

The argument of sine should be dimensionless, so the dimensions of  $b$  should be  $T^{-1}$ . Since dimensions of  $s$  are  $L$ , the dimensions of  $a$  are also  $L$ .

Answer:  $[a] = [L], [b] = [T]^{-1}$ .