

**Answer on Question #51540-Physics-Other**

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.  $[a] = [L]^{-1}, [b] = [L]^{-1}$  B.  $[a] = [T]^{-1}, [b] = [L]$  C.  $[a] = [L], [b] = [T]^{-1}$  D.  $[a] = [L]^2, [b] = [T]^{-2}$

**Solution**

The expression  $\sin(bt)$  must be dimensionless, so

$$[a] = [s] = [L]$$

and

$$[bt] = 1 \rightarrow [b] = \frac{1}{[t]} = [T]^{-1}.$$

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

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