Answer on Question #62942-Physic-Other

A physical quantity x depends on quantities y and z as follows: x = Ay + B tan Cz, where A, B and C are constants. Which of the following do not have the same dimensions?

a.   x and A

b.   y and B/A

c.   C and z-1

d.   x and B

Solution

$$[x] = [\text{ B tan Cz}] = [\text{ B }]$$

$$[\text{ tan Cz}] = 1 \rightarrow [\text{ Cz}] = 1 \rightarrow [\text{ C}] = [\text{ z}^{-1}]$$

$$[x] = [\text{ Ay}] \rightarrow [y] = \left[\frac{x}{A}\right] = \left[\frac{B}{A}\right]$$

$$[x] = [\text{ Ay}] = \left[A\frac{B}{A}\right] = [\text{ B }] \neq [A]$$

Answer: a. x and A.