

If $2^x = 4^y = 8^z$, and
 $\left(\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z}\right) = \frac{24}{7}$, then
the value of z is.

$$2^x = 2^{2y} = 2^{3z}$$

$$x = 2y = 3z = k$$

$$x = k$$

$$y = k/2$$

$$z = k/3$$

a. $7/16$

b. $7/32$

c. $7/48$

d. $7/64$

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$$\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z} = \frac{24}{7}$$

$$\Rightarrow \frac{1}{2k} + \frac{1}{4 \cdot \frac{k}{2}} + \frac{1}{6 \cdot \frac{k}{3}} = \frac{24}{7}$$

$$\Rightarrow \frac{3}{k} = \frac{24}{7} \Rightarrow k = 7/16$$

$$k = 7/16 \text{ for, } z = k/3 = \frac{7/16}{3} = \boxed{\frac{7}{48}} \checkmark$$