

1  
2 CONVERT TO BASE 10:  $(1011011.001)_2$

$$\begin{aligned}(1011011.001)_2 &= 1.011011001 \times 2^6 = \left(1 + 0 + \frac{1}{2^2} + \frac{1}{2^3} + 0 + \dots\right. \\&\dots = \left(1 + \frac{1}{4} + \frac{1}{8} + \frac{1}{32} + \frac{1}{64} + \frac{1}{512}\right) 2^6 \\&= \left(\frac{512}{512} + \frac{128}{512} + \frac{64}{512} + \frac{16}{512} + \frac{8}{512} + \frac{1}{512}\right) 64 \\&= \left(\frac{729}{512} \cdot 64\right)_{10} = \boxed{9.1125 \times 10}\end{aligned}$$
$$\begin{aligned}&\dots + \frac{1}{2^5} + \frac{1}{2^6} + 0 + 0 + \dots \\&\dots + \frac{1}{2^9} \Big) 2^6 = \dots\end{aligned}$$