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5. If $x = \log_2 3$, then $\log_2 8\sqrt{3}$ can be represented as an algebraic expression, in terms of x, as

A $\frac{1}{2}x + 8$ **B** $2x + 8$

C $\frac{1}{2}x + 3$ **D** $2x + 3$

$\log_2 8\sqrt{3} = \log_2 2^3 \cdot \sqrt{3} = \log_2 2^3 + \log_2 \sqrt{3} =$

$= \log_2 2^3 + \log_2 \sqrt{3} =$

was give to be equal to x

$= 3\log_2 2 + \log_2 3^{\frac{1}{2}} = 3 \cdot 1 + \frac{1}{2}\log_2 3 = 3 + \frac{1}{2}\log_2 3$

$= 3 + \frac{1}{2}x \Rightarrow$ the answer is option (C) ✓