$$\log_9(27 \cdot 81) = \log_9(27) + \log_9(81)$$

$$= \log_9(9^{3/2}) + \log_9(9^2)$$

Note:

$27 = 3^3$, $9 = 3^2$

$\log_9(27) = x$

$\Rightarrow 9^x = 27$

$\Rightarrow (3^2)^x = 3^3$

$\Rightarrow 3^{2x} = 3^3$

$\Rightarrow 2x = 3$

$\Rightarrow x = 3/2$

✓ check: $9^{3/2} = (9^{1/2})^3 = (\sqrt{9})^3 =$

$= \frac{3}{2} \cdot \log_9(9) + 2 \cdot \log_9(9)$ Note: $\log_9(9) = 1$

$= \frac{3}{2} + 2 = \frac{7}{2}$.