

- a. Given that $3^a = 27$, write down the value of a
b. Hence or otherwise solve $27^{x+4} = 9^{3x+1}$

a.

$$3^3 = 27$$

$$a = 3$$

b.

$$3^3 = 27$$

$$3^2 = 9$$

$$27^{x+4} = 9^{3x+1}$$

$$(3^3)^{x+4} = (3^2)^{3x+1}$$

$$3^{3x+12} = 3^{6x+2}$$

$$3x + 12 = 6x + 2$$

$$10 = 3x$$

$$\frac{10}{3} = x$$

$$x = 3\frac{1}{3}$$