Answer key

The method: Exponential equations

Write both sides as powers of the same base, then set the exponents equal.

$2^{x+3} = 32 \quad x = 2$

$2^{x+3} = 2^5$ $32 = 2^5$

$x + 3 = 5$ same base: set the exponents equal

$x = 2$

$9^{x+3} = 27 \quad x = -\frac{3}{2}$

$3^{2(x+3)} = 3^3$ write both sides as powers of 3: $9 = 3^2$

$2(x + 3) = 3$ set the exponents equal

$2x = -3$

$x = -\frac{3}{2}$

Problems 1 and 2 worked out · Version 0A

$27^x = 81 \quad x = \frac{4}{3}$

$3^{3x} = 3^4$ write both sides as powers of 3: $27 = 3^3$

$3x = 4$ set the exponents equal

$x = \frac{4}{3}$

$2^{x+1} = 4 \quad x = 1$

$2^{x+1} = 2^2$ $4 = 2^2$

$x + 1 = 2$ same base: set the exponents equal

$x = 1$

Exponential equations · Version 0A

1) $x = \frac{4}{3}$ 2) $x = 1$ 3) $x = 2$ 4) $x = \frac{1}{2}$ 5) $x = 2$
6) $x = 4$ 7) $x = 2$ 8) $x = 4$ 9) $x = 8$ 10) $x = 2$

11) $x = \frac{1}{2}$ 12) $x = 0$ 13) $x = \frac{1}{2}$ 14) $x = 6$

15) $x = \frac{5}{2}$ 16) $x = -1$ 17) $x = \frac{3}{2}$ 18) $x = \frac{5}{3}$

19) $x = \frac{1}{3}$ 20) $x = 3$ 21) $x = \frac{2}{3}$ 22) $x = 8$