

Solve each exponential equation algebraically.

$$20) 7^{x+2} = 7^{3x-1}$$

$$x+2 = 3x-1$$

$$3 = 2x$$

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

$$21) 5^{3x+6} = 5^{21}$$

$$3x+6 = 21$$

$$3x = 15$$

$$x = 5$$

$$22) 2^{3x+3} = 32^{x-1}$$

$$2^{3x+3} = (2^5)^{x-1}$$

$$3x+3 = 5x-5$$

$$8 = 2x$$

$$4 = x$$

$$23) 8^x = 4^{x+2}$$

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

$$2^{3x} = 2^{2x+4}$$

$$3x = 2x+4$$

$$x = 4$$

$$24) 3^x = 9^7$$

$$3^x = (3^2)^7$$

$$x = 14$$

$$25) 4^{2x} = 8^{x-3}$$

$$(2^2)^{2x} = (2^3)^{x-3}$$

$$4x = 3x-9$$

$$x = -9$$

$$26) 4^x + 7 = 71$$

$$4^x = 64$$

$$4^x = 4^3$$

$$x = 3$$

$$(2^2)^x = 2^6$$
$$2x = 6$$
$$x = 3$$

$$27) 3^{5x+2} = 9^x$$

$$3^{5x+2} = (3^2)^x$$

$$5x+2 = 2x$$

$$3x = -2$$

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