

17. $64 = 4 \cdot 4^{4x}$	18. $9^{2x+4} \cdot 9^{2x} = \frac{1}{81}$
19. $\frac{1}{7} = 49^{x-5} \cdot 7^{x-9}$	20. $4^{2x} \cdot \frac{1}{16} = 4^{6x+18}$

Your Turn:

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

$$4^{2x+3} = 4^0$$

$$x = -3/2$$

$$2) 5^{3-2x} = 5^{-x}$$

$$3-2x = -x$$

$$3 = x$$

$$3) 3^{1-2x} = 243$$

$$3^{1-2x} = 3^5$$

$$1-2x = 5$$

$$-2x = 4$$

$$x = -2$$

$$4) 3^{2a} = 3^{-a}$$

$$2a = -a$$

$$a = 0$$

$$5) 4^{3x-2} = 1$$

$$3x-2 = 0$$

$$3x = 2$$

$$x = 2/3$$

$$6) 4^{2p} = 4^{-2p-1}$$

$$2p = -2p-1$$

$$4p = -1$$

$$p = -1/4$$

$$7) 6^{-2a} = 6^{2-3a}$$

$$-2a = 2-3a$$

$$a = 2$$

$$8) 2^{2x+2} = 2^{3x}$$

$$2x+2 = 3x$$

$$x = 2$$

$$9) 6^{3m} \cdot 6^{-m} = 6^{-2m}$$

$$6^{2m} = 6^{-2m}$$

$$m = 0$$

$$10) \frac{2^x}{2^x} = 2^{-2x}$$

$$0 = -2x$$

$$x = 0$$

$$11) 10^{-3x} \cdot 10^x = \frac{1}{10}$$

$$10^{-2x} = 10^{-1}$$

$$x = +\frac{1}{2}$$

$$12) 3^{-2x+1} \cdot 3^{-2x-3} = 3^{-x}$$

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

$$-4x-2 = -x$$

$$-2 = 3x$$

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

$$13) 4^{-2x} \cdot 4^x = 64$$

$$4^{-x} = 4^3$$

$$x = -3$$

$$14) 6^{-2x} \cdot 6^{-x} = \frac{1}{216}$$

$$6^{-3x} = 6^{-3}$$

$$x = 1$$

$$15) 2^x \cdot \frac{1}{32} = 32$$

$$2^x \cdot 2^{-5} = 2^5$$

$$2^{x-5} = 2^5$$

$$x = 10$$

$$16) 2^{-3p} \cdot 2^{2p} = 2^{2p}$$

$$2^{-p} = 2^{2p}$$

$$-p = 2p$$

$$p = 0$$

$$17) 64 \cdot 16^{-3x} = 16^{3x-2}$$

$$2^6 \cdot 2^{-12x} = 2^{12x-8}$$

$$6-12x = 12x-8$$

$$14 = 24x$$

$$x = \frac{14}{24} = \frac{7}{12}$$

$$18) \frac{81^{3n+2}}{243^{-n}} = 3^4$$

$$\frac{(3^4)^{3n+2}}{(3^5)^{-n}} = 3^4$$

$$3^{12n+8+5n} = 3^4$$

$$17n+8=4$$

$$17n=-4$$

$$n = -\frac{4}{17}$$

$$19) 81 \cdot 9^{-2b-2} = 27$$

$$3^4 \cdot (3^2)^{-2b-2} = 3^3$$

$$3^4 \cdot 3^{-4b-4} = 3^3$$

$$20) 9^{-3x} \cdot 9^x = 27$$

$$9^{-2x} = 27$$

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

$$4-4b-4 = 3$$

$$-4b = 3 \quad b = -\frac{3}{4}$$

$$-4n = 3$$

$$n = -\frac{3}{4}$$