

HW23: Solving Exponential Equations

Solve each equation.

1. $5^{2m+3} = 625$

2. $3^{-2n} = 81$

3. $5^{-2x} = 5^{-x+3}$

4. $\frac{1}{4} = 4^{2x-3}$

5. $5^3 \cdot 625^{2x} = \frac{1}{125}$

6. $49 \cdot \left(\frac{1}{49}\right)^{m-1} = \frac{1}{7}$

7. $8^{k+3} \cdot \left(\frac{1}{2}\right)^{-2k} = \left(\frac{1}{64}\right)^{-2k}$

8. $216^{3x} \cdot 216^x = 36$

$$9. 6^{3a} \cdot 36 = 6^{2a+1}$$

$$10. \frac{1}{216} \cdot 36^{-x} = \left(\frac{1}{216}\right)^{2x}$$

$$11. \frac{6^{2b-2}}{6^{3b}} = 216$$

$$12. 5^{x+3} = 125$$

$$13. 2^x - 2^{4x-3} = 0$$

$$14. 5^{3x} \cdot 5^5 = 5^7$$

$$15. 100^{2x} = 10^{3x-1}$$

$$16. 8^{x+3} = 16^{x-1}$$

$$17. 4^x = \frac{1}{\sqrt{2}}$$

$$18. e^{x+1} = \frac{1}{e}$$

Answers

1. $\frac{1}{2}$
2. -2
3. -3
4. 1
5. $-\frac{3}{4}$
6. $\frac{5}{2}$
7. $\frac{9}{7}$
8. $\frac{1}{6}$
9. -1
10. $\frac{3}{4}$
11. -5
12. 0
13. 1
14. $\frac{2}{3}$
15. -1
16. 13
17. $-\frac{1}{4}$
18. -2