Exponential equations: harder worksheet – Grade 9

Grade 9 · Mixed level · 20 questions · **Version X6602**

Name: _____ Date: _____ Score: ___ / 20

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1. What value of x makes $3^{x-4} = \frac{1}{81}$ true?

   Answer: _____

2. Solve: $2^{x+5} = 512$

   Answer: _____

3. Find x: $3^{2x} = 4782969$

   Answer: _____

4. Solve for x: $9^{x} = 9$

   Answer: _____

5. What value of x makes $3^{x-5} = \frac{1}{243}$ true?

   Answer: _____

6. Find x: $3^{2x} = 531441$

   Answer: _____

7. Solve for x: $2^{x+1} = 64$

   Answer: _____

8. Solve for x: $\frac{8^{x}}{4^{1}} = 2^{3}$. Give a fraction if needed.

   Answer: _____

9. Solve for x: $9^{x+1} = 27^{x-5}$

   Answer: _____

10. Solve: $9^{x+3} = 27^{x-4}$

    Answer: _____

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11. Solve: $\frac{27^x}{9^2} = 3^5$. Give a fraction if needed.

    Answer: _____

12. Solve for x: $9^x \times 3 = 27^2$. Give a fraction if needed.

    Answer: _____

13. Solve: $9^{x+2} = 27^{x-2}$

    Answer: _____

14. Solve: $\frac{8^x}{4^3} = 2^2$. Give a fraction if needed.

    Answer: _____

15. A culture of 300 cells doubles every hour. After how many hours are there 600 cells?

    Answer: _____ hours

16. A 256 mg sample halves every hour. After how many hours is 8 mg left?

    Answer: _____ hours

17. Solve: $2^{x+2} + 2^x = 80$

    Answer: _____

18. Solve for x: $2^{x+1} + 2^x = 12$

    Answer: _____

19. A culture of 300 cells doubles every hour. After how many hours are there 19200 cells?

    Answer: _____ hours

20. Solve for x: $2^{x+2} - 2^x = 24$

    Answer: _____

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Answer key · Version X6602

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1. **0**
2. **4**
3. **7**
4. **1**
5. **0**
6. **6**
7. **5**
8. **5/3**
9. **17**
10. **18**
11. **3**
12. **5/2**
13. **10**
14. **8/3**
15. **1**
16. **5**
17. **4**
18. **2**
19. **6**
20. **3**

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