Exponential Problems #1

These start at Achieved, and go through to Excellence

1. Solve $3^x = 27$

2. Solve $x^4 = 256$

3. Solve $5^x + 2 = 27$

4. Solve $\dfrac{m^2}{4} = 16$

5. Solve $2^{x-2} = 32$

6. Solve $(2^x)^3 = 64$

7. Solve $\dfrac{10^t}{4} = 250$

8. Solve $4 \times 3^{x+1} = 36$

9. Solve $3^x \times 2^x = 216$

10. Solve $\dfrac{162}{3^x} = 2$

11. Solve $25^k = 125$

12. Solve $3^{2n} < 100$ where n is integer

13. Solve $4^n = 8^{n-1}$

14. Solve $\dfrac{9^{x+1}}{3^x} = 27$

15. Solve $6^{a+1} = 54 \times 2^a$

16. Solve $3 \times 2^{n+2} < 150$ where n is integer

Exponential Problems #1 – Answers

These start at Achieved, and go through to Excellence

1. Solve $3^x = 27$ $3^3 = 27$ $x = 3$

2. Solve $x^4 = 256$ $4^4 = 27$ $x = 4$

3. Solve $5^x + 2 = 27$ $5^x = 27 - 2$ $5^2 = 25$ $x = 2$

4. Solve $\dfrac{m^2}{4} = 16$ $m^2 = 4 \times 16$ $8^2 = 64$ $m = 8$

5. Solve $2^{x-2} = 32$ $2^{x-2} = 2^5$ $x - 2 = 5$ $x = 7$

6. Solve $(2^x)^3 = 64$ $(2^x)(2^x)(2^x) = 64$ $8^x = 64$ $x = 2$

7. Solve $\dfrac{10^t}{4} = 250$ $10^t = 1000$ $t = 3$

8. Solve $4 \times 3^{x+1} = 36$ $3^{x+1} = 9$ $x + 1 = 2$ $x = 1$

9. Solve $3^x \times 2^x = 216$ $6^x = 6^3$ $x = 3$

10. Solve $\dfrac{162}{3^x} = 2$ $\dfrac{162}{2} = 3^x$ $81 = 3^x$ $x = 4$

11. Solve $25^k = 125$ $5^{2k} = 5^3$ $2k = 3$ $k = 1.5$

12. Solve $3^{2n} < 100$ (*n* is integer) $3^{2n} < 3^5 \ (=243)$ $2n < 5$ $n \leq 2$

13. Solve $4^n = 8^{n-1}$ $2^{2n} = 2^{3n-3}$ $2n = 3n - 3$ $n = 3$

14. Solve $\dfrac{9^{x+1}}{3^x} = 27$ $\dfrac{9^x \times 9}{3^x} = 27$ $3^x = \dfrac{27}{9}$ $x = 1$

15. Solve $6^{a+1} = 54 \times 2^a$ $6^a \times 6 = 54 \times 2^a$ $6^a \ \cancel{\times 6} = 9 \ \cancel{\times 6} \times 2^a$

                                       $3^a \times 2^a = 9 \times 2^a$ $a = 2$

16. Solve $3 \times 2^{n+2} < 150$ (*n* is integer) $2^{n+2} < 50$ $2^{n+2} < 2^6$ $n < 4$