

Algebra 1  
6.5 Worksheet #1

Name: \_\_\_\_\_

Solve the equation. Show all work for full points. Check your solution.

1. $2^5 = 2^{x+1}$	2. $6^{2x} = 6^6$	3. $3^{2x-7} = 3^{3x+4}$
4. $4^{10} = (4^{x+1})^2$	5. $\left(\frac{1}{2}\right)^3 = 2^{3x}$	6. $\left(\frac{1}{8}\right)^{x-4} = 8^{4x+1}$

Match the original problem with its equivalent form with like bases. Do not solve.

Original problem

Equivalent form with like bases

\_\_\_ 7.  $2^{x-5} = 8$

A.  $7^x = 7^{-3}$

\_\_\_ 8.  $343^x = 7^{2x+5}$

B.  $11^{-2} = 11^x$

\_\_\_ 9.  $\frac{1}{121} = 11^x$

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

\_\_\_ 10.  $\left(\frac{1}{2}\right)^x = 8$

D.  $7^{2x+5} = 7^{3x}$

\_\_\_ 11.  $121^{x-5} = 11$

E.  $11^{2x-10} = 11$

\_\_\_ 12.  $7^x = \frac{1}{343}$

F.  $2^{-1} = 2^3$

**Solve the equation. Show all work for full points. Check your solution.**

- 1. Rewrite the problem with like bases.**
- 2. Set exponents equal to each other.**
- 3. Solve for the given variable.**
- 4. Check your solution.**

13. $36 = 6^x$	14. $5^x = 625$	15. $\left(\frac{1}{3}\right)^x = 81$
16. $4^x = 2^{5x+3}$	17. $25^{x-2} = 125^{3x+1}$	18. $\left(\frac{1}{3}\right)^{2x-2} = 27^{2x-2}$

19. A small container holds 100 bacteria. The amount of bacterial doubles every hour and can be modeled by  $f(t) = 100(2)^t$ , where  $t$  is the amount of time in hours. How long will it take for the bacteria to reach 1600 bacteria?

20. Solve the equation.  $\left(\sqrt[5]{3}\right)^x = 3^{x-4}$