Algebra 1 **Name: _____**
6.5 Worksheet #1

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 as 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. $\left(\sqrt[5]{3}\right)^x = 3^{x-4}$