Name: _____ Date: _____

BLM 6–8

Section 6.3 Represent Exponential Expressions

1. Write each power as a power with base 4.

a) 1024 **b)** 64^2

c) 16^0 **d)** 256^3

e) 2^{12} **f)** 2^{16}

2. Write each power as a power with base 10.

a) 10 000 **b)** 1000^5

c) $100\,000^3$ **d)** 0.01

e) 0.1^4 **f)** 0.001

3. Write each power as a power with base 2.

a) 128 **b)** 8^2

c) 32^3 **d)** 16^6

e) 64^0 **f)** 256^2

4. **a)** Solve $9^{x+5} = 3^x$.

b) Substitute your answer from part a) into both sides of the original equation to check.

5. Solve.

a) $2^{12} = 16^x$ **b)** $8^{2a+1} = 64$

c) $4^{3p+1} = 32$ **d)** $4^{5-9k} = 8^{2-k}$

e) $27^{x+3} = 9^{5-2x}$ **f)** $\dfrac{8^{x+8}}{8^{4x}} = 32^{3x-4}$

6. Solve, then check.

a) $27^{x+2} = 9^{4x}$ **b)** $16^{2x+3} = 32^{3(x-2)}$

7. **a)** Use graphing technology to graph $y = 27^{x+2}$ and $y = 9^{4x}$ on the same set of axes.

b) Identify the point of intersection. How is this point related to your answer to question 6, part a)? Explain.

8. Consider the equation $16^{x+2} = 64^{x-1}$.

a) Solve this equation by expressing both sides as powers of 4.

b) Solve this equation by expressing both sides as powers of 2.

c) How do your answers to parts a) and b) compare?

d) Which method do you prefer? Why?

9. Consider the equation $16^{2x-1} = 64^{2(x+1)}$.

a) Solve this equation by expressing both sides as powers of 4.

b) Solve this equation by expressing both sides as powers of 2.

c) How do your answers to parts a) and b) compare?

d) Which method do you prefer? Why?

10. For each equation, complete the following steps:

i) Rewrite the power with the fractional base as a power with a whole number base.

ii) Write the expressions on both sides as powers with the same base.

iii) Solve the equation.

a) $5^{4-x} = \dfrac{1}{5}$

b) $3^{3x-1} = \dfrac{1}{81}$

c) $27^{x+1} = \left(\dfrac{1}{9}\right)^{2x-5}$

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