Name: _____ Date: _____

Chapter 3 Prerequisite Skills

BLM 3–1

Exponent Rules

1. Describe each exponent rule and give an example.
- **a)** Product rule
- **b)** Quotient rule
- **c)** Power rule

2. Simplify.
- **a)** $(x^6)(x^4)$
- **b)** $(y^3)(y^7)(y^9)$
- **c)** $m^5 \div m^4$
- **d)** $h^6 \div h^8$
- **e)** $\sqrt{h^6} \div \sqrt{h^8}$
- **f)** $\dfrac{x^{10}}{x^5}$
- **g)** $\left(yz^2\right)^3$
- **h)** $\left[-(x)^2\right]^2$
- **i)** $\left(x^2\right)^3\left(y^3\right)^2$
- **j)** $\dfrac{(-x)^2}{(-x)}$

3. Evaluate.
- **a)** $3^2 \times 3^3$
- **b)** $\left(2^3\right)\left(2^4\right)\left(2^2\right)$
- **c)** $(-1)^6(-1)^2(-1)^3$
- **d)** $5^5 \div \sqrt{5^4}$
- **e)** $\left((-5)^2\right)^2$
- **f)** $\left(2^5\right)^3 \div \left(2^7\right)^2$
- **g)** $\dfrac{\left(4^2\right)^3}{\left(4^1\right)^2}$
- **h)** $\dfrac{\left((-3)^3\right)^2}{(-3)^4}$

Zero and Negative Exponents

4. Consider the function $y = 3^x$.
- **a)** Copy and complete the table of values.

x	y
4	$3^4 = 81$
3	
2	
1	
0	

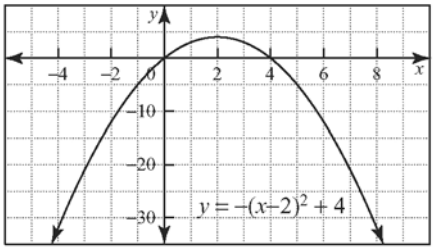
- **b)** Describe the pattern that exists in the y-values.
- **c)** Extend the chart to include negative values from -1 to -3.
- **d)** Explain how this extension can be used to explain the meaning of negative exponents.

5. Simplify. Express answers with positive exponents.
- **a)** $(-2)^0$
- **b)** 3^{-3}
- **c)** -4^0
- **d)** $4^{-5} \times 4^2$
- **e)** $\left(\dfrac{2}{3}\right)^{-2}$
- **f)** $(-2)^{-3}$
- **g)** $3^{-2} \times 2^{-3}$
- **h)** $6^{-1} \times 6^0$

6. Simplify each expression. Leave all answers with positive exponents.
- **a)** $\left(-3xy\right)^{-1}$
- **b)** $\left(y^{-3}\right)^2 \times \left(y^2\right)^3$
- **c)** $\dfrac{a^5b^{-3}}{a^3b^{-1}}$
- **d)** $\left(3x^2y^3\right)^{-3}$

Graph Functions

7. For the graph shown, state the
- **i)** domain
- **ii)** range
- **iii)** x- and y-intercepts



8. Sketch each function. Then, identify the
- **i)** domain
- **ii)** range
- **iii)** x- and y-intercepts (if they exist)
- **a)** $y = \sqrt{x+9}$
- **b)** $y = x^2 - 16$

Transformations of Functions

9. Graph each function by applying transformations to the base function $y = x^2$.
- **a)** $y = 2x^2$
- **b)** $y = (x+3)^2 - 1$
- **c)** $y = -x^2 + 1$
- **d)** $y = -(x+5)^2 + 2$

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