St Thomas Aquinas High School (Mr. N. Cune & revised by Mrs. Wong)

Name: ______ Block:_____

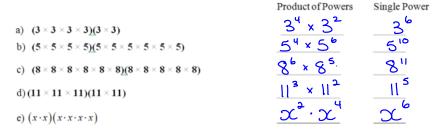
3.2 Exponent Laws

Warm Up: In the expression 3⁴, 3 represents the and 4 represents the

1. Write each expression as a single power. Then, evaluate.

	Repeated Multiplication	Single Powe
a) $2^4 \times 2^4$	(3 x3x3x3) x (2x3x3x2)	
b) $(-4)^2 \times (-4)^2$	(-4)(-4) x (-4)(-4)	_(- <i>વ</i>) ^ન
c) $6^2 \times 6$	(6x6) x 6	63
d) $9^3 \times 9^3$	(9×9×9)(9×9×9)	96
e) $b \times b^3$	bx (bxbxb)	<u>b</u> "

2. Write each expression as a product of two powers, then as a single power.



3. Write each expression as a single power. Then, evaluate.

Single Power Single Power
$$\frac{3^2}{9}$$

b) $(-5)^3 \times (-5)^2$ Product $\frac{3^2}{-3125}$

c) $[(-2)^2]^3$ Power $\frac{3^2}{-3125}$

d) $8^2 + 8^2$ Quotient $\frac{8^6}{-9}$

e) $(-y)^4(-y)^3$ Product $\frac{1}{-y}^7$

f) $(-b)^4(-b)^2$ Product $\frac{1}{-y}^7$

4. Does- $8^2 = (-8)^2$? Justify your answer. -8^2 means $-1 \times 8 \times 8$ -1 is the coefficient = -64 8 is the base $(-8)^2$ means (-8)(-8) -8 is the base = 64

 ${\bf 5.}\ \ {\bf Arrange\ the\ powers\ in\ order\ from\ smallest\ value\ to\ largest\ value.}$

$$(-4)^{2}, (2)^{3}, (-1)^{5}$$

 $-(4)^{3}$ $(-1)^{5}$ $(-1)^{5}$ $(-1)^{2}$
 $-(4)^{3}$ $(-1)^{5}$ $(-1)^{5}$ $(-1)^{5}$ $(-1)^{5}$ $(-1)^{5}$

5. Write each expression as a quotient of two powers, then as a single power.

Quotient of Powers Single Power
$$5^4 \div 5^2$$
 5^2

$$7^3 \div 7^3$$

$$\frac{d}{d} \frac{(2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2)}{(2 \times 2 \times 2 \times 2 \times 2)}$$

e)
$$\frac{b \times b \times b \times b}{b \times b \times b}$$

7. Write each expression as a single power with a coefficient, then evaluate

Single Power with Coefficient
$$3(-2)^4$$
 3×10^4

Sincient Evaluate
$$3 \times 16 = 48$$

b)
$$2(5)^4 \times (5)^3$$

$$\lambda (5)^{7}$$

c)
$$(-1)^{\frac{1}{2}} \times (-1)^{\frac{1}{2}}$$

d)
$$(15 \times (2^{10}) \div (5 \times (2^{3}))$$

6. Complete the table.

Expression	Repeated Multiplication	Powers
$a) \left[3 \times \left(-4 \right) \right]^2$	[-12x-12] or 3x3x-4x-4	$(-12)^2$ or $3^2 \times (-4)^2$
b) (4 × 6) ²	$(24)(24)$ or $4 \times 4 \times 6 \times 6$	242 or 42 x 62
c) $\left(\frac{2}{3}\right)^5$	$(\frac{2}{3})(\frac{2}{3})(\frac{2}{3})(\frac{2}{3})(\frac{2}{3})$	$\frac{2^5}{3^5}$ or $\left(\frac{2}{3}\right)^5$
$\mathbf{d}) \left(x \cdot y \right)^3$	$x \cdot x \cdot x \cdot y \cdot y \cdot y$	$\chi^3 y^3$

Multiple Choice Questions

7. In the equation $(-2)^5 = -32$, which number represents the base of the power?

$$A - 32$$

$$(B-2)$$

$$D_2$$

8. Which expression is equivalent to $(-2) \times (-2) \times (-2) \times (-2) \times (-2)$?