

### 3.3 – Exponent Laws Worksheet #1

MPM1D

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1. Write each expression as a single power and then evaluate.

a)  $7^2 \times 7^4$

b)  $3^5 \times 3^3$

c)  $5 \times 5^2$

d)  $3^2 \times 3^4 \times 3^3$

e)  $(-2)^2 \times (-2)^3$

f)  $(-1)^3 \times (-1)^2 \times (-1)$

g)  $0.5^3 \times 0.5^2$

h)  $\left(\frac{1}{2}\right) \times \left(\frac{1}{2}\right)^3$

2. Write each expression as a single power and then evaluate.

a)  $8^6 \div 8^4$

b)  $5^5 \div 5^3$

c)  $7^7 \div 7^2$

d)  $4^8 \div 4^5 \div 4$

e)  $(-9)^7 \div (-9)^6$

f)  $0.1^6 \div 0.1^4$

g)  $(-0.3)^4 \div (-0.3)$

h)  $\left(\frac{2}{3}\right)^5 \div \left(\frac{2}{3}\right)^3$

3. Write each expression as a single power and then evaluate.

a)  $(2^2)^4$

b)  $(6^2)^2$

c)  $(3^3)^2$

d)  $[(-2)^4]^3$

e)  $[(-1)^8]^6$

f)  $[(-1)^5]^7$

g)  $(0.3^2)^2$

h)  $\left[\left(\frac{2}{5}\right)^2\right]^2$

4. Use the exponent laws to simplify each expression. Then, evaluate.

a)  $4^3 \times 4^4 \div 4^5$

b)  $8^7 \div 8^7 \times 8$

c)  $\frac{9^6 \times 9^3}{9^7}$

d)  $\frac{6^5 \times 6^2}{6 \times 6^3}$

e)  $(2^4)^2 \times 2^3$

f)  $\frac{(3^2)^4 \times 3^3}{3^8}$

**g)**  $0.2^6 \times 0.2^5 \div (0.2^2)^5$

**h)**  $[(-4)^3]^4 \div [(-4)^2]^5$

**5.** Simplify.

**a)**  $b^5 \times b^3$

**b)**  $p^4 \times p$

**c)**  $w^5 \div w^2$

**d)**  $x^8 \div x^4$

**e)**  $(m^5)^2$

**f)**  $(k^2)^3 \times k^2$

**g)**  $g^5 \times g^5 \div g^7$

**h)**  $(a^6)^3 \div (a^5)^2$

**5.** Simplify

**a)**  $4x^3 \cdot 2x^3$

**b)**  $\frac{8x^{10}}{6x^2}$

**c)**  $(3y^2)^3$

**d)**  $\frac{(x^2)^4 \cdot 3x^5}{6x^{10}}$

## Answers

1. a)  $7^6 = 117\,649$   
b)  $3^8 = 6561$   
c)  $5^3 = 125$   
d)  $3^9 = 19\,683$   
e)  $(-2)^5 = -32$   
f)  $(-1)^6 = 1$   
g)  $0.5^3 = 0.031\,25$   
h)  $\left(\frac{1}{2}\right)^4 = \frac{1}{16}$

2. a)  $8^2 = 64$   
b)  $5^2 = 25$   
c)  $7^5 = 16\,807$   
d)  $4^2 = 16$   
e)  $(-9)^1 = -9$   
f)  $0.1^2 = 0.01$   
g)  $(-0.3)^3 = -0.027$   
h)  $\left(\frac{2}{3}\right)^2 = \frac{4}{9}$

3. a)  $2^8 = 256$   
b)  $6^4 = 1296$   
c)  $3^6 = 729$   
d)  $(-2)^{12} = 4096$   
e)  $(-1)^{48} = 1$   
f)  $(-1)^{35} = -1$   
g)  $0.3^4 = 0.0081$   
h)  $\left(\frac{2}{5}\right)^4 = \frac{16}{625}$

4. a)  $4^2 = 16$   
b)  $8^1 = 8$   
c)  $9^2 = 81$   
d)  $6^3 = 216$   
e)  $2^{11} = 2048$   
f)  $3^3 = 27$   
g)  $0.2^1 = 0.2$   
h)  $(-4)^2 = 16$

5. a)  $b^8$   
b)  $p^5$   
c)  $w^3$   
d)  $x^4$   
e)  $m^{10}$   
f)  $k^8$   
g)  $\frac{g^3}{8}$   
h)  $a^8$

6. a)  $8x^6$   
b)  $\frac{4x^8}{3}$   
c)  $27y^6$   
d)  $\frac{x^3}{2}$