3.3 – Exponent Laws Worksheet #1

MPM1D

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

a) $7^2 \times 7^4$ **b)** $3^5 \times 3^3$ **c)** 5×5^2

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)** $\frac{\left(3^2\right)^4 \times 3^3}{3^8}$

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) $0.5^5 = 0.031\,25$
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) g^3
h) a^8

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