

Class/HomeworkSection 2.5
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4. Write each expression as a product of powers.

a) $(6 \times 4)^3$ b) $(2 \times 5)^4$ c) $[(-2) \times 3]^5$

d) $(25 \times 4)^2$ e) $(11 \times 3)^1$ f) $[(-3) \times (-2)]^3$

5. Write each expression as a quotient of powers.

a) $(8 \div 5)^3$ b) $(21 \div 5)^4$ c) $[(-12) \div (-7)]^5$

d) $\left(\frac{10}{3}\right)^3$ e) $\left(\frac{1}{3}\right)^2$ f) $\left(\frac{27}{100}\right)^4$

6. Write as a power.

a) $(3^2)^4$ b) $(6^3)^3$ c) $(5^3)^1$

d) $(7^0)^6$ e) $-(8^2)^2$ f) $[(-3)^4]^2$

7. Simplify $(2^4)^2$ and $(2^2)^4$. What do you notice? Explain the results.

8. Write each expression as a product or quotient of powers.

a) $[3 \times (-5)]^3$

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

c) $\left(\frac{2}{3}\right)^4$

d) $\left(\frac{-7}{-2}\right)^2$

e) $-[(-10) \times 3]^3$

f) $(16 \div 9)^2$

9. Why is the value of $(-5^2)^3$ negative?

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10. Simplify each expression, then evaluate it.

For each expression, state the strategy you used and why.

a) $(3 \times 2)^3$ | b) $[(-2) \times 4]^2$ | c) $\left(\frac{9}{-3}\right)^3$

d) $\left(\frac{8}{2}\right)^2$ | e) $(12^8)^0$ | f) $[(-4)^2]^2$

14. Simplify, then evaluate. Show your work.

a) $(3^2 \times 3^1)^2$

b) $(4^6 \div 4^4)^2$

c) $[(-2)^0 \times (-2)^3]^2$

d) $(10^6 \div 10^4)^3$

e) $(10^3)^2 \times (10^2)^3$

f) $(12^2)^4 \div (12^3)^2$

g) $(5^2)^6 \div (5^3)^4$

h) $[(-2)^2]^3 \times (-2)^3$

Copy the solution and correct the errors.

a) $(3^2 \times 2^2)^3 = (6^4)^3$	b) $[(-3)^2]^3 = (-3)^5$
$= 6^{12}$	$= -243$
$= 2\,176\,782\,336$	

c) $\left(\frac{6^2}{6^1}\right)^2 = 6^4$	d) $(2^6 \times 2^2 \div 2^4)^3 = (2^3)^3$
$= 1296$	$= 2^9$
	$= 512$

e) $(10^2 + 10^3)^2 = (10^5)^2$
$= 10^{10}$
$= 10\,000\,000\,000$

16. Simplify, then evaluate each expression.

a) $(4^2 \times 4^3)^2 - (5^4 \div 5^2)^2$

b) $(3^3 \div 3^2)^3 + (8^4 \times 8^3)^0$

c) $(2^3)^4 + (2^4 \div 2^3)^2$

d) $(6^2 \times 6^0)^3 + (2^6 \div 2^4)^3$

e) $(5^3 \times 5^3)^0 - (4^2)^2$

f) $(10^5 \div 10^2)^2 + (3^3 \div 3^1)^4$

17. Simplify, then evaluate each expression.

a) $[(-2)^3 \times (-2)^2]^2 - [(-3)^3 \div (-3)^2]^2$

b) $[(-2)^3 \div (-2)^2]^2 - [(-3)^3 \times (-3)^2]^2$

c) $[(-2)^3 \times (-2)^2]^2 + [(-3)^3 \div (-3)^2]^2$

d) $[(-2)^3 \div (-2)^2]^2 + [(-3)^3 \times (-3)^2]^2$

e) $[(-2)^3 \div (-2)^2]^2 - [(-3)^3 \div (-3)^2]^2$

f) $[(-2)^3 \times (-2)^2]^2 + [(-3)^3 \times (-3)^2]^2$

19. Simplify, then evaluate each expression.

a) $(2^3 \times 2^6)^2 - (3^7 \div 3^5)^4$

b) $(6 \times 8)^5 + (5^3)^2$

c) $[(-4)^3 \times (-4)^2]^2 + (4^3 \times 4^2)^2$

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

e) $[(-3)^4]^2 \times [(-4)^0]^2 - [(-3)^3]^0$

f) $[(-5) \times (-4)]^3 + [(-6)^3]^2 - [(-3)^9 \div (-3)^8]^5$

Worksheet

Mathematics 9

Name _____

Laws of Exponents

Simplify.

1) $(-5)^3 \cdot (-5)^4$

2) $8^5 \cdot 8^2$

3) $(-3)^5 \cdot (-3)^2$

4) $(-6)^0 \cdot (-6)^4 \cdot (-6)^4$

5) $5 \cdot 5^2$

6) $5 \cdot 5^3$

7) $\frac{5^5}{5^2}$

8) $\frac{(-4)^3}{(-4)^0}$

9) $\frac{2^2}{2^6}$

10) $\frac{(-3)^0}{(-3)^0}$

11) $\frac{(-4)^{12}}{(-4)^5}$

12) $\frac{4^{17}}{4^{12}}$

13) $((-4)^3)^2$

14) $(-6)^2$

$$19) \frac{2^4 \cdot 2^3}{2 \cdot 2^2}$$

$$20) \frac{2^{13}}{2 \cdot 2^4}$$

$$21) \frac{3^2}{9}$$

$$22) \frac{3^{44}}{3^2 \cdot 3^4}$$

$$23) \frac{7^2 \cdot 7^3}{7^4}$$

$$24) \frac{3^2 \cdot 3^2}{3^3}$$

$$25) \left(\frac{3^8}{3^3} \right)^3$$

$$26) \frac{(4^4)^4}{4}$$

$$27) \left(\frac{(-2)^5}{(-2)^4} \right)^2$$

$$28) \frac{((-2)^3)^2}{(-2)^3}$$

29) $\frac{4^2}{4^2}$

30) $\frac{(4^3)^2}{4}$

31) $\frac{3^2 \cdot (3^2)^4}{3^4}$

32) $\left(\frac{3^6 \cdot 3^2}{3^4}\right)^4$

33) $\left(\frac{2^2 \cdot 2^4}{2}\right)^3$

34) $\frac{(-4)^2 \cdot (-4)^2}{((-4)^4)^2}$

35) $\frac{(2^4)^2}{2^3 \cdot 2^2}$

36) $\left(\frac{3^6 \times 3^8 \div 3^4}{3^6 \times 3^6}\right)^0$

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