

# Class/Homework

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Questions : 3,4, 5,6,7,8,9,10, 11,  
13,15, 17,18, 19

3. When can you not add or subtract exponents to multiply or divide powers?

4. Write each product as a single power.

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

c)  $(-3)^3 \times (-3)^3$

e)  $(-4)^1 \times (-4)^3$

g)  $2^0 \times 2^4$

b)  $10^2 \times 10^{11}$

d)  $21^6 \times 21^4$

f)  $6^{12} \times 6^3$

h)  $(-7)^3 \times (-7)^0$

5. Write each quotient as a power.

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

c)  $15^{10} \div 15^0$

e)  $\frac{2^{12}}{2^{10}}$

g)  $\frac{6^5}{6^1}$

b)  $8^9 \div 8^6$

d)  $(-6)^8 \div (-6)^3$

f)  $\frac{(-10)^{12}}{(-10)^6}$

h)  $\frac{(-1)^5}{(-1)^4}$

**6. a) Evaluate.**

i)  $3^4 \div 3^4$

ii)  $(-4)^6 \div (-4)^6$

iii)  $\frac{5^8}{5^8}$

iv)  $\frac{(-6)^3}{(-6)^3}$

b) Use the results of part a. Explain how the exponent law for the quotient of powers can be used to verify that a power with exponent 0 is 1.

7. a) Compare these products.

i)  $3^4 \times 3^9$

ii)  $3^9 \times 3^4$

b) Explain the results in part a.

8. Express as a single power.

a)  $3^4 \times 3^9 \div 3^{11}$

b)  $(-4)^3 \div (-4)^2 \times (-4)^{10}$

c)  $6^0 \times 6^3 \div 6^2$

d)  $\frac{4^3 \times 4^5}{4^2 \times 4^6}$

e)  $\frac{(-3)^4 \times (-3)^4}{(-3)^4}$

9. a) Express as a single power, then evaluate.

$$\text{i) } (-6)^1 \times (-6)^7 \div (-6)^7 \quad \bigg| \quad \text{ii) } (-6)^7 \div (-6)^7 \times (-6)^1$$

b) Explain why changing the order of the terms in the expressions in part a does not affect the answer.

10. Simplify, then evaluate.

a)  $10^2 \times 10^2 + 10^4$

b)  $10^3 \times 10^3 - 10^3$

c)  $10^{11} - 10^3 \times 10^6$

d)  $10^1 + 10^5 \times 10^2$

e)  $10^6 \div 10^2 \times 10^2$

f)  $10^9 \div 10^9$



g)  $\frac{10^{12}}{10^6}$

h)  $\frac{10^4 \times 10^3}{10^2}$

i)  $\frac{10^{11}}{10^4 \times 10^2}$

j)  $\frac{10^5}{10^3} + 10^2$

11. a) Evaluate:  $2^6 - 2^2 \times 2^3$

b) Evaluate:  $2^6 \times 2^2 - 2^3$

c) Were the steps for parts a and b different? Explain.

13. Evaluate.

a)  $2^3 \times 2^2 - 2^5 \times 2$

b)  $3^2 \times 3 + 2^2 \times 2^4$

c)  $4^2 - 3^0 \times 3 + 2^3$

d)  $(-3)^6 \div (-3)^5 - (-3)^5 \div (-3)^3$

e)  $(-2)^4[(-2)^5 \div (-2)^3] + (-2)^4$

f)  $-2^4(2^6 \div 2^2) - 2^4$

g)  $(-5)^3 \div (-5)^2 \times (-5)^0 + (-5)^2 \div (-5)$

15. Identify, then correct any errors in the student work below. Explain how you think the errors occurred.

a)  $4^3 \times 4^4 = 4^{12}$       b)  $\frac{(-7^6)}{(-7^3)} = (-7)^2$   
c)  $3^2 \times 2^3 = 6^5$       d)  $\frac{5^8}{5^4 \times 5^2} = 1$   
e)  $1^2 + 1^3 \times 1^2 = 1^7$

**17. a) Evaluate.**

i)  $5^2 + 5^3$

ii)  $5^2 \times 5^3$

- b) In part a, explain why you could use an exponent law to simplify one expression, but not the other.

18. a) Evaluate.

i)  $4^3 - 4^2$

ii)  $4^3 \div 4^2$

b) In part a, explain why you could use an exponent law to simplify one expression, but not the other.

19. Simplify, then evaluate only the expressions with a positive value. Explain how you know the sign of each answer without evaluating.

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

b)  $(-2)^0 \times (-2)^5$

c)  $(-2)^5 \div (-2)^3$

d)  $(-2)^6 \div (-2)^6$

e)  $\frac{(-2)^3 \times (-2)^4}{(-2)^3 \times (-2)^2}$

f)  $\frac{(-2)^6}{(-2)^3 \times (-2)^2}$