NAME: _____ DATE: _____

EXPONENTS PERIOD: _____

How Do You Divide Numbers With the Same Base?

(Topic #2)

Example: Find $7^5 \div 7^3$

Find each quotient.

1. $3^7 \div 3^3$

2. $4^7 \div 4^5$

3. $2^7 \div 2^6$

4. $5^4 \div 5$

Dividing Powers with the Same Base		
Words	**Arithmetic**	**Algebra**
To divide numbers or variables with the same base: 1. 2.		

Write each expression using a single exponent.

5. $2^9 \div 2^7$

6. $r^9 \div r^6$

7. $c^4 \div c^2$

8. $\frac{(-7)^9}{(-7)^3}$

9. $\frac{h^7}{h^6}$

10. $\frac{4.2^6}{4.2^5}$

EXAMPLE 2: Simplifying an Expression

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

B) $\frac{5^6 \cdot 5^2}{5^4}$

11. $\frac{a^{10}}{a^6} \cdot \frac{a^7}{a^4}$

12. $\frac{2^{15}}{2^3 \cdot 2^5}$

13. $\frac{d^5}{d} \cdot \frac{d^9}{d^8}$

NAME: _____ DATE: _____

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Homework #2

Simplify the expression. Write your answer as a power.

1. $\frac{6^{10}}{6^4}$	2. $\frac{8^9}{8^7}$	3. $\frac{(-3)^4}{(-3)^1}$	4. $\frac{4.5^5}{4.5^3}$
5. $\frac{5^9}{5^3}$	6. $\frac{64^4}{64^3}$	7. $\frac{(-17)^5}{(-17)^2}$	8. $\frac{(-7.9)^{10}}{(-7.9)^4}$
9. $\frac{(-6.4)^8}{(-6.4)^6}$	10. $\frac{\pi^{11}}{\pi^5}$	11. $\frac{b^{24}}{b^{11}}$	12. $\frac{n^{18}}{n^7}$

Simplify the expression. Write your answer as a power.

13. $\dfrac{7^5 \cdot 7^3}{7^2}$

14. $\dfrac{2^{19} \cdot 2^5}{2^{12} \cdot 2^3}$

15. $\dfrac{(-8.3)^8}{(-8.3)^7} \cdot \dfrac{(-8.3)^4}{(-8.3)^3}$

16. $\dfrac{\pi^{30}}{\pi^{18} \cdot \pi^4}$

17. $\dfrac{c^{22}}{c^8 \cdot c^9}$

18. $\dfrac{k^{13}}{k^5} \cdot \dfrac{k^{17}}{k^{11}}$

19. Describe and correct the error in simplifying the quotient.

✗ $\dfrac{6^{15}}{6^5} = 6^{\frac{15}{5}}$

$= 6^3$

NAME: KEY _____ DATE: _____

EXPONENTS PERIOD: _____

How Do You Divide Numbers With the Same Base?

(Topic #2)

Example: Find $7^5 \div 7^3$

$7^5 \div 7^3 \rightarrow \frac{7^5}{7^3} = \frac{7 \cdot 7 \cdot 7 \cdot 7 \cdot 7}{7 \cdot 7 \cdot 7} = \frac{7 \cdot 7}{1} = 7^2$

Find each quotient.

1. $3^7 \div 3^3$

$\frac{3^7}{3^3} = \frac{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3}{3 \cdot 3 \cdot 3} = \frac{3^4}{1} = 3^4$

2. $4^7 \div 4^5$

$\frac{4^7}{4^5} = \frac{4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4}{4 \cdot 4 \cdot 4 \cdot 4 \cdot 4} = \frac{4^2}{1} = 4^2$

3. $2^7 \div 2^6$

$\frac{2^7}{2^6} = \frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = 2^1$

4. $5^4 \div 5$

$\frac{5^4}{5} = \frac{5 \cdot 5 \cdot 5 \cdot 5}{5} = \frac{5^3}{1} = 5^3$

Dividing Powers with the Same Base		
Words	**Arithmetic**	**Algebra**
To divide numbers or variables with the same base: 1. Keep the base. 2. Subtract the exponents.	$\frac{7^5}{7^3} = 7^{5-3} = 7^2$	$\frac{a^m}{a^n} = a^{m-n}$ where $a \neq 0$

Write each expression using a single exponent.

5. $2^9 \div 2^7$

$2^{9-7} = 2^2$

6. $r^9 \div r^6$

$r^{9-6} = r^3$

7. $c^4 \div c^2$

$c^{4-2} = c^2$

8. $\frac{(-7)^9}{(-7)^3}$

$(-7)^{9-3} = (-7)^6$

9. $\frac{h^7}{h^6}$

$h^{7-6} = h^1$

10. $\frac{4.2^6}{4.2^5}$

$4.2^{6-5} = 4.2^1$

EXAMPLE 2: Simplifying an Expression

A) $\frac{3^4 \cdot 3^2}{3^3} = \frac{3^6}{3^3} = 3^3$

B) $\frac{5^6 \cdot 5^2}{5^4} = \frac{5^8}{5^4} = 5^4$

11. $\frac{a^{10}}{a^6} \cdot \frac{a^7}{a^4}$

$a^4 \cdot a^3$

a^7

OR

$\frac{a^{10} \cdot a^7}{a^6 \cdot a^4}$

$\frac{a^{17}}{a^{10}}$

a^7

12. $\frac{2^{15}}{2^3 \cdot 2^5}$

$\frac{2^{15}}{2^8}$

2^7

13. $\frac{d^5}{d^4} \cdot \frac{d^9}{d^8}$

$d^4 \cdot d^1$

d^5

NAME: KEY

EXPONENTS

DATE: _____

PERIOD: _____

Homework #2

Simplify the expression. Write your answer as a power.

1. $\frac{6^{10}}{6^4}$ $6^{10-4} = 6^6$	2. $\frac{8^9}{8^7}$ $8^{9-7} = 8^2$	3. $\frac{(-3)^4}{(-3)^1}$ $(-3)^{4-1} = (-3)^3$	4. $\frac{4.5^5}{4.5^3}$ $4.5^{5-3} = 4.5^2$
5. $\frac{5^9}{5^3}$ $5^{9-3} = 5^6$	6. $\frac{64^4}{64^3}$ $64^{4-3} = 64^1$	7. $\frac{(-17)^5}{(-17)^2}$ $(-17)^{5-2} = (-17)^3$	8. $\frac{(-7.9)^{10}}{(-7.9)^4}$ $(-7.9)^{10-4} = (-7.9)^6$
9. $\frac{(-6.4)^8}{(-6.4)^6}$ $(-6.4)^{8-6} =$ $(-6.4)^2$	10. $\frac{\pi^{11}}{\pi^7}$ $\pi^{11-7} = \pi^4$	11. $\frac{b^{24}}{b^{11}}$ $b^{24-11} = b^{13}$	12. $\frac{n^{18}}{n^7}$ $n^{18-7} = n^{11}$

Simplify the expression. Write your answer as a power.

13. $\frac{7^5 \cdot 7^3}{7^2} = \frac{7^8}{7^2} = 7^6$

14. $\frac{2^{19} \cdot 2^5}{2^{12} \cdot 2^3} = \frac{2^{24}}{2^{15}} = 2^9$

15. $\frac{(-8.3)^6}{(-8.3)^7} \cdot \frac{(-8.3)^4}{(-8.3)^3}$

$(-8.3)^1 \cdot (-8.3)^1$

$(-8.3)^2$

16. $\frac{\pi^{30}}{\pi^{18} \cdot \pi^4}$

$\frac{\pi^{30}}{\pi^{22}} = \pi^8$

17. $\frac{c^{22}}{c^8 \cdot c^9}$

$\frac{c^{22}}{c^{17}} = c^5$

18. $\frac{k^{13}}{k^5} \cdot \frac{k^{17}}{k^{11}}$

$k^8 \cdot k^6$

k^{14}

19. Describe and correct the error in simplifying the quotient.

Instead of subtracting the exponents, they divided them.

$\frac{6^{15}}{6^5} = 6^{15-5} = 6^{10}$