

Name: _____

Date: _____

HW # 3 Product Rule

Remember standard form is preferred when its possible

Simplify each of the following.

1) $4^3 \cdot 4^1$

$4^{3+1} = 4^4$ or 256

2) $\frac{5x^7}{3} \cdot 9x^6$

$\frac{5}{3} \cdot 9 \cdot x^{7+6} = 15x^{13}$

3) $7x^5 \cdot 2x^3$

$7 \cdot 2 \cdot x^{5+3}$
 $14x^8$

4) $2x^1 \cdot x^2 \cdot 4x^3$

$2 \cdot 4 \cdot x^{1+2+3}$
 $8x^6$

5) $2n^4 \cdot 5n^4$

$2 \cdot 5 \cdot n^{4+4}$
 $10n^8$

6) $6r^1 \cdot 5r^2$

$6 \cdot 5 \cdot r^{1+2}$
 $30r^3$

7) $4.2 \times 10^{12} \cdot 2 \times 10^2$

$4.2 \cdot 2 \cdot 10^{12+2}$
 $8.4 \cdot 10^{14}$ or 840,000,000,000,000

8) $3 \times 10^3 \cdot 5 \times 10^4$

$3 \cdot 5 \cdot 10^{3+4}$
 $15 \cdot 10^7$
 $1.5 \cdot 10^1 \cdot 10^7$

$1.5 \cdot 10^8$
or 150,000,000

9) $4a^3b^4 \cdot 12a^2b^7$

$4 \cdot 12 \cdot a^{3+2} \cdot b^{4+7}$
 $48a^5b^{11}$

10) $2xy^6 \cdot 4x^5y^2$

$2 \cdot 4 \cdot x^{1+5} \cdot y^{6+2}$
 $8x^6y^8$

Write all answers in both scientific notation and standard form.

Be careful that you think about if you should multiply. Not all of them are multiplication!

11. McDonalds has about 2.1×10^5 managers and each manager makes on average 4×10^4 dollars per year.

How much money does McDonalds spend on its managers each year?

one manager
all managers
total money?
so multiply

$2.1 \cdot 10^5 \cdot 4 \cdot 10^4$
 $2.1 \cdot 4 \cdot 10^{5+4}$

$\$8.4 \cdot 10^9$ or $\$8,400,000,000$

12. Jill makes bracelets out of rubber bands. Last month she used $3.73 \cdot 10^3$ rubber bands. This month she used $2.87 \cdot 10^3$ rubber bands. How many total rubber bands did she use in these two months?

1 month
1 month
total? → Just Add

$$3.73 \cdot 10^3 + 2.87 \cdot 10^3$$

$$\begin{array}{r} 3730 \\ + 2870 \\ \hline 6600 \text{ rubber bands} \\ \text{or } 6.6 \times 10^3 \end{array}$$

13. The SR-71 Blackbird is one of the world's fastest airplanes. It is capable of traveling at Mach 3, or three times the speed of sound. The speed of sound is approximately 7.6×10^2 miles per hour. What is Mach 3 in miles per hour?

Speed of sound
times 3
↑
multiply

$$7.6 \cdot 10^2 \cdot 3$$

$$7.6 \cdot 3 \cdot 10^2$$

$$22.8 \cdot 10^2$$

$$2.28 \cdot 10^3$$



$$2.28 \cdot 10^3 \text{ miles per hour}$$

$$\text{or } 2280 \text{ mph}$$

14. Using the information below, how much money did the US lose by making nickels in 2016?

How much does it cost to make a nickel 2016?

About 1.7 cents to make a penny and **8 cents** to make a nickel, according to a new report from the U.S. Government Accountability Office. Jan 11, 2016

they lose 3¢ per nickel

loss per one
how many there are
total lost?
yep multiply

3¢ or \$.03

can be written

3×10^{-2}

US Mint Annual Coin Production

	Year 2015	Year 2015	2016
Cents	9,365,300,000	9,118,400,000	
Nickels	1,599,600,000	1,546,560,000	

$$3 \times 10^{-2} \cdot 1.54656 \cdot 10^9$$

multiply

$$\$ 4.63968 \times 10^7$$

$$\text{or } \$ 46,396,800$$