## **Working with Exponents**

Part A

Complete the following table:

Power	Standard Form
20	
2 <sup>1</sup>	
2 <sup>2</sup>	
2 <sup>3</sup>	
24	
2 <sup>5</sup>	
2 <sup>6</sup>	
2 <sup>7</sup>	

Power	Standard Form
28	
29	
2 <sup>10</sup>	
2 <sup>11</sup>	
2 <sup>12</sup>	
2 <sup>13</sup>	
2 <sup>14</sup>	
2 <sup>15</sup>	

## Part B

Use your calculator to complete the following calculations – then convert the solution back to power form using the table above.

Calculate	Standard Form	Power Form
$2^3 \times 2^5$		
$2^6 \times 2^9$		
$2^4 \times 2^3 \times 2^2$		
$2^0 \times 2^{10} \times 2$		

Did you notice any patterns as you completed the exercises in part B? Explain.  Use the patterns you noticed to complete the table below. $ \begin{array}{c c} \hline \textbf{Calculate} & \textbf{Power Form} \\ \hline 2^4 \times 2^9 \times 2^7 \\ \hline 2^{14} \times 2^3 \\ \hline 5^4 \times 5^3 \times 5 \\ \hline 7^2 \times 7^5 \\ \hline 3 \times 3^5 \times 1 \end{array} $	2 <sup>1</sup> >	.2		
Use the patterns you noticed to complete the table below.		any natterns as you completed th	ne evercises in nart R2 Evnlain	
CalculatePower Form $2^4 \times 2^9 \times 2^7$ $2^{14} \times 2^3$ $2^{14} \times 2^3$ $5^4 \times 5^3 \times 5$ $7^2 \times 7^5$ $7^2 \times 7^5$	na you notice a	my patterns as you completed th	ie exercises in part b: Explain.	
CalculatePower Form $2^4 \times 2^9 \times 2^7$ $2^{14} \times 2^3$ $2^{14} \times 2^3$ $5^4 \times 5^3 \times 5$ $7^2 \times 7^5$ $7^2 \times 7^5$				
CalculatePower Form $2^4 \times 2^9 \times 2^7$ $2^{14} \times 2^3$ $2^{14} \times 2^3$ $5^4 \times 5^3 \times 5$ $7^2 \times 7^5$ $7^2 \times 7^5$				
CalculatePower Form $2^4 \times 2^9 \times 2^7$ $2^{14} \times 2^3$ $2^{14} \times 2^3$ $5^4 \times 5^3 \times 5$ $7^2 \times 7^5$ $7^2 \times 7^5$				
CalculatePower Form $2^4 \times 2^9 \times 2^7$ $2^{14} \times 2^3$ $2^{14} \times 2^3$ $5^4 \times 5^3 \times 5$ $7^2 \times 7^5$ $7^2 \times 7^5$				
CalculatePower Form $2^4 \times 2^9 \times 2^7$ $2^{14} \times 2^3$ $2^{14} \times 2^3$ $5^4 \times 5^3 \times 5$ $7^2 \times 7^5$ $7^2 \times 7^5$				
$2^{4} \times 2^{9} \times 2^{7}$ $2^{14} \times 2^{3}$ $5^{4} \times 5^{3} \times 5$ $7^{2} \times 7^{5}$	Jse the pattern	s you noticed to complete the ta	ble below.	
$2^{14} \times 2^{3}$ $5^{4} \times 5^{3} \times 5$ $7^{2} \times 7^{5}$		Calculate	Power Form	
$5^4 \times 5^3 \times 5$ $7^2 \times 7^5$		2 <sup>4</sup> ×2 <sup>9</sup> × 2 <sup>7</sup>		
$5^4 \times 5^3 \times 5$ $7^2 \times 7^5$		2 <sup>14</sup> ×2 <sup>3</sup>		
7 <sup>2</sup> ×7 <sup>5</sup>				
<u> </u>				
			<u>I</u>	_
Do you think it would be easier to do the calculations in the table above with or without a calculator? Explain.	calculator? Exp			
	calculator? Exp			
	calculator? Exp			
	calculator? Exp			

## Part D

Use your calculator to complete the following calculations – then convert the solution back to power form using the table from part A.

Calculate	Standard Form	Power Form
$2^5 \div 2^3$		
$\frac{2^{15}}{2^9}$		
$2^{14} \div 2^{7} \div 2^{2}$		
$2^{10} \div 2^{3} \div 2$		
$2^{1} \div 2^{0}$		

## Part E

Did you notice any patterns as you completed the exercises in part B? Explain.			

Use the patterns you noticed to complete the table below.

Calculate	Power Form
$2^{30} \div 2^5 \div 2^2$	
$2^{34} \div 2^{23}$	
$5^{14} \div 5^{3} \div 5$	
$\frac{7^5}{7^2}$	

	$3^9 \div 3$	<sup>5</sup> ÷ 1			
Do you think it	uwould be easier t	to do the calcula	tions in the prev	ious table with o	r without a
calculator? Exp	lain.				
Part F					
Can you use an	y of the patterns	you noticed bef	ore to complete	the following?	
Calcu	ulate	Standa	rd Form	Power	Form
2 <sup>3</sup> >	< 3 <sup>2</sup>				
4 <sup>6</sup> >	< 5 <sup>6</sup>				
$2^4 \times 3$	<sup>4</sup> × 5 <sup>4</sup>				
$2^5 \times 5$	2 × 2				
0 <sup>2</sup> >	<2				
Why or Why No	ot?				
Part G					

Explain WHY this pattern occurs when you are multiplying or dividing powers.