Part A: Working with Exponents and Radicals [N-RN.A.1]

1. **Complete** the table below using the completed rows as a reference.

Expression A			Expression B			Observations
Exponent Form	Expanded Form	Value	Exponent Form	Expanded Form	Value	
3^4			$3^2 3^2$			
3^3	$3 \bullet 3 \bullet 3$	27	$3^2 3^1$	$(3 \bullet 3)(3)$	27	I noticed that the expressions are equivalent by the product rule and have the same value.
3^2			$3^2 3^0$			
3^1			$3^2 3^{-1}$			
3^0			$3^2 3^{-2}$			
3^{-1}			$3^2 3^{-3}$			
3^{-2}	$\frac{1}{3 \bullet 3}$	$\frac{1}{9}$	$3^2 3^{-4}$	$(3 \bullet 3)\left(\frac{1}{3 \bullet 3 \bullet 3 \bullet 3}\right)$	$\frac{1}{9}$	I noticed that 2 minus 4 is -2 which is the power of the first expression.
3^{-3}			$3^2 3^{-5}$			

2. **Write** an equivalent expression.

A) $7^{\frac{2}{3}}$ B) $\sqrt{20}$ C) $\sqrt[3]{2^4}$

3. **Rewrite** each expression in the form $a^m b^n$.

A) $\left(a^3 b^5 b^2\right)^2$ B) $\left(a^3 a^{-5} b^7\right)^4$ C) $\frac{\left(ab^2\right)^2}{a^3 b}$

4. **Determine** if each statement is true for all values of *x*. If not, provide a counter example.

A) $4^x = 2^{2x}$ B) $8^{2x} = 16^x$ C) $2^{3x} = 3^{2x}$

Part B: Working with Polynomials [A-APR.A.1]

5. **Rewrite** each expression, using as few terms as possible.

A) $(5x^2+4x+2)-(2x+3)$

B) $(3x^2+4x-2)+(2x^2-5x+13)$

C) $(x^2+3x)-(2x^2-5x+1)$

D) $(x^2+2x+1)-2(3x-1)$

6. **Multiply** to write an equivalent expression using two methods.

A) $-2x(3x-1)$

Method 1	**Method 2**

B) $(a-12)^2$

Method 1	**Method 2**

C) $(3x-2)(4x+1)$

Method 1	**Method 2**