- Review base 4 representation. You have only 4 symbols to represent any number!
- Base 13, Now your digits are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C
- **Power representation:**

$$(ab)^n = \underbrace{ab \cdot ab \cdots ab}_{n \ times} = \underbrace{a \cdot a \cdots a}_{n \ times} \cdot \underbrace{b \cdot b \cdots b}_{n \ times} = a^n b^n$$

$$a^m a^n = \underbrace{a \cdot a \cdots a}_{m \ times} \cdot \underbrace{a \cdot a \cdots a}_{n \ times} := \underbrace{a \cdot a \cdots a}_{m+n \ times} = a^{m+n}$$

MATH 5: <u>HOMEWORK 10</u>,
<u>December 8, 2024</u>

1. Write these numbers in base 4. Use classwork handout if needed. Example $5 = 11_4$.
   0, 4, 5, 16, 32, 48, 64, 65

2. Write these numbers in base 13. Use classwork handout if needed. Example $13 = 10_{13}$.
   0, 4, 5, 16, 32, 48, 64, 65

3. Write using power representation:
   a. $2 \cdot 2 \cdot 2 \cdot 3 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 4 = 2^? \cdot 3^?$
   b. $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 10^? = 2^? \cdot 5^?$
   c. $\dfrac{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a}{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a} = a^?$
   d. $\dfrac{a}{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a} =$
   e. $\dfrac{2 \cdot 5 \cdot 7 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 7 \cdot 2 \cdot 2} =$

4. Solve the following equations:

   (a) $5(x - 1) - 4 = 3x + 1$

   (b) $\frac{2}{3}(x - 2) = -18$

   (c) $|2x + 1| = 7$

   (d) $-|3x - 7 + 8x| = -15$

   (e) $\frac{x-8}{11} = -35$

   (f) $\frac{x+16}{x} = -7$

   (g) $\frac{x}{x-7} = 5$

   (h) $\frac{x-6}{x-9} = 8$

   (i) $\frac{x-15}{11-x} = -12$

5. X and Y together have 96 cents; Y and Z together have 108 cents; Z and X together have 100 cents. How much money does each of them have? (*Write system of equations. Add or subtract equations from one another to solve the problem. Remember, you can do this because equations are equalities*)