

MATH 5: CLASSWORK 9,

December 6, 2020

- Base 4 representation. See handout. You have only 4 symbols to represent any number!
- **Power representation:**

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

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

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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. Add two base 4 numbers: *[Do not add in base 10 and translate the result to base 4, try performing addition in base 4, **think base 4!**]*

$$\begin{array}{r} 123 \\ + 321 \\ \hline \end{array} \qquad \begin{array}{r} 3201 \\ + 2310 \\ \hline \end{array}$$

3. Write using power representation:
 - a. $2 \cdot 2 \cdot 2 \cdot 3 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 2 \cdot 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 4 = 2^? \cdot 3^?$
 - b. $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 10^? = 2^? \cdot 5^?$
 - c. $\frac{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a}{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a} = a^?$
 - d. $\frac{a}{a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a} =$ fraction would be OK.
 - e. $\frac{2 \cdot 5 \cdot 7 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 7 \cdot 2 \cdot 2} =$

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*)