

MATH 6: Homework 19.

January 19, 2021

Algebra and formulas for fast multiplication and factorization

$$(a \pm b)^2 = a^2 \pm 2ab + b^2$$

$$(a + b)(a - b) = a^2 - b^2$$

And **factorizing**:

$$a(b + c) = ab + ac$$

1. Factorize by taking terms outside of parenthesis:
 - a. $6a + 12 =$
 - b. $mn + n =$
 - c. $5xy - 15x =$
 - d. $4ax - 8ax^2 + 12ax^2 =$
2. Factorize using formulas for fast multiplication:
 - a. $9 - x^2 =$
 - b. $x^6 - 4 =$
 - c. $9 - 6x + x^2 =$
 - d. $a^3 - 2a^2x + ax^2 =$
3. Show that the LHS = RHS:
 - a. $(m - n)(a + b) + m - n = a(m - n) + (b + 1)(m - n)$
 - b. $x^2(x + 1) - x - 1 = x(x + 1)^2 - (x + 1)^2$
 - c. $2x(x + b) + a(x + b) = (2x + a)x + (2x + a)b$
 - d. $(a + b)^2 + c(a + b) = (a + b)(a + c) + (a + b)b$
4. Solve the equations:
 - a. $2x(x - 1) = 2(x^2 - 5)$
 - b. $\frac{1}{6}x - \frac{2}{9}(x + 5) = -\frac{1}{18}(x - 1)$
 - c. $3x^2 - (3x + 2)(x - 1) - (x + 2) = 0$
5. Solve the equations:
 - a. $|7x + 3| = 18$
 - b. $|x + 17| = -3$
 - c. $-|x + 2| + 3 = 0$
6. You are in a chemistry class and you are given a 5l solution which contains 8% sugar. How many l of 15% sugar solution do you have to add to obtain a:
 - a. 10% solution
 - b. 16% solution