

## Math 6d: Homework 22

HW#22 is due March 31; submit to Google classroom 15 minutes before the class time.

*Please, write clearly which problem you are solving and show all steps of your solution.*

### Algebra review: formulas for fast multiplication

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

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

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

And *factorizing*:

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

### Homework questions

- Factorize by taking terms outside of the brackets:
  - $6a + 12 =$
  - $mn + n =$
  - $5xy - 15x =$
  - $4ax - 8ax^2 + 12ax^2 =$
- Factorize using the formulas for fast multiplication:
  - $9 - x^2 =$
  - $x^6 - 4 =$
  - $9 - 6x + x^2 =$
  - $a^3 - 2a^2x + ax^2 =$
- Show that the LHS = RHS:
  - $(m - n)(a + b) + m - n = a(m - n) + (b + 1)(m - n)$
  - $x^2(x + 1) - x - 1 = x(x + 1)^2 - (x + 1)^2$
  - $2x(x + b) + a(x + b) = (2x + a)x + (2x + a)b$
  - $(a + b)^2 + c(a + b) = (a + b)(a + c) + (a + b)b$
- Solve the equations:
  - $2x(x - 1) = 2(x^2 - 5)$
  - $\frac{1}{6}x - \frac{2}{9}(x + 5) = -\frac{1}{18}(x - 1)$
  - $3x^2 - (3x + 2)(x - 1) - (x + 2) = 0$
- Solve the equations:
  - $|7x + 3| = 18$
  - $|x + 17| = -3$
  - $-|x + 2| + 3 = 0$

6. You are in a chemistry class and you are given a 5L solution that contains 8% sugar. How many *liters* of 20% sugar solution do you have to add to obtain a:
- (a) 10% solution
  - (b) 16% solution