## SchoolNova, Math 5b <br> Homework 5 <br> Algebra: Substitution, Removing Parenthesis, Exponents October 21, 2018

Please provide sufficient details about how you solved the problem. More difficult problems are marked with a *. If unable to solve a problem, please present your thoughts and any partial solution.

1. Compute the following powers:
(a) $5^{4}$
(b) $7^{3}$
(c) $4^{-2}$
(d) $(-2)^{5}$
2. Find each of the following products
(a) $\left(3 a^{2}\right) \times\left(5 a^{3}\right)$
(b) $(-5 a) \times\left(-10 a^{2}\right) \times\left(-2 a^{3}\right)$
(c) $\left(4 a^{2} b\right) \times\left(3 a^{3} b^{3}\right) \times\left(2 a b^{4}\right) \times(-2)$
3. Simplify each of the following algebraic expressions, by opening the parenthesis:
(a) $7 \times(x+y)$
(b) $x \times(3 x+5)$
(c) $x \times(x+y)$
(d) $7 \times(x+y+2)$
4. Determine each of the following products, by opening parenthesis and collecting like terms:
(a) $(x+y) \times(x+y)$
(b) $(x+y) \times(x-y)$
(c) $(2 x+3 y) \times(2 x+3 y)$
(d) $(2 x+3 y) \times(2 x-3 y)$
5. Evaluate the following algebraic expressions for $x=3$ and $y=7$ :
(a) $2 x+3$
(b) $x^{2}+y^{2}$
(c) $(x+y)^{2}$
(d) $-x^{2}-y^{2}+3$
(e) $3 x^{3} y^{2}$
6. (a) An ATM machine dispenses cash using $\$ 20$ and $\$ 50$ bills. What sum can one withdraw using this ATM?
(b) An ATM machine in the imaginary country of Khiva dispenses cash using 15 tugrik and 35 tugrik (tugrik is the name of the local currency). What sums can one withdraw using this ATM?
7.     * I climb half the steps in a staircase. Next, I climb one-third of the remaining steps. Then I climb one-eighth of the rest and stop to catch my breath. What is the smallest possible number of steps in the staircase?
8. Write down the lower case Greek alphabet (that is, the symbols and the names). For example: $\alpha$ alpha $\beta$ beta $\vdots$
