

SchoolNova, Math 5c
Homework 6
Algebraic Expressions, Absolute Values and Inequalities
October 29, 2017

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. Evaluate $|4 - 8(3 - 12)| - |5 - 11|$.
2. Evaluate $20 - |-x + 7|$ for $x = 14$.
3. Write the mathematical inequality: 11 is less than the product of m and n .
4. Determine if true or false:
 - (a) $|10 + 25| = |10| + |25|$
 - (b) $|13 - 7| = |13| - |7|$
 - (c) $|36 + (-6)| = |36| + |-6|$
 - (d) $|49 - (-3)| = |49| - |-3|$
 - (e) $-|-5| = -5$
5. Determine the following:
 - (a) $|a - 7|$, if $a > 7$
 - (b) $|a - 7|$, if $a < 7$
 - (c) $|a + 4|$, if $a > -4$
 - (d) $|a + 4|$, if $a < -4$
6. Evaluate the following algebraic expressions for $x = 3$ and $y = 7$:
 - (a) $2x + 3$
 - (b) $x^2 + y^2$
 - (c) $(x + y)^2$
 - (d) $-x^2 - y^2 + 3$
 - (e) $3x^3y^2$
7. Simplify each of the following algebraic expressions, by opening the parenthesis and collecting like terms:
 - (a) $-x^2 + [-(3x^2 + 2y^2) + (3x^2 + y^2)]$
 - (b) $x - \frac{1}{3}(x^2 + 3x + 6)$
 - (c) $xy - [yz - xz + (xy - 3yz)]$
 - (d) $(xy^2)^2 + (xy)^2 + 3(x^2y^4 + x^2y^2)$
8. * 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? (Hint: If the number of steps is x , and the number of steps I have to climb after catching my breath is y , what is the relation between x and y ?)