SchoolNova, Math 5c
Homework 9
Algebraic Equations with Absolute Values and Inequalities
November 17, 2019

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 the following expressions, with absolute values:
   (a) $|27|$
   (b) $|-11|$
   (c) $|10-25|$
   (d) $|14|-|-3|$
   (e) $|13|-|7|$
   (f) $|36+(-6)|$
   (g) $|21|+|-4|$
   (h) $|49-(-3)|$
   (i) $-|-5|$

2. Solve the following inequalities, and plot on a number line:
   (a) $x \leq 4$
   (b) $x \geq 7$
   (c) $x+3 \leq 5$
   (d) $2x < 10$
   (e) $x^2 \leq 9$

3. Solve the following equations containing absolute values, and plot on a number line:
   (a) $|x| = 3$.
   (b) $|x+2| = 7$.
   (c) $|2x| = 10$.
   (d) $|3x-12| = 0$.

4. Show that each of the following numbers are solutions to the given equations or inequalities:

   (a) $x = 3$ in $x^2 - 9 = 0$.

   (b) $x = -5$ in $x^2 \geq 16$.

   (c) $x = -1$ in $2x - 3 \leq -2$.

   (d) $x = 1$ in $2(x - 5) \leq 4x$.

   (e) $x = 5$ in $|4 - x| \leq 2$.

5. The sum of two consecutive even integers is 26. What are the two numbers?

6. The area of a rectangle is 24 cm^2. The width is 2 cm less than the length. What are the length and the width?

7. The number 100 is multiplied either by 2 or by 3, then the result is increased either by 1 or by 2, and then the new result is divided either by 3 or by 4. If the final result is a natural number, what is the final result?

8. Carla wants to fold a cube from a paper net. By mistake, she drew 7 squares on her sheet instead of 6 squares. Which square(s) can she remove so that the figure remains connected, and Carla can fold a cube from it?