SchoolNova, Math 5b
Homework 9
Algebra Review
December 2, 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 expressions:

   (a) $\frac{4}{5} \div \frac{3}{10}$

   (b) $\frac{3/4}{2/3}$

   (c) $(2 \div 3) \div 5$

   (d) $1 \div (2 + \frac{1}{3})$

   (e) $\frac{2}{2+\frac{1}{2+3}}$

2. Simplify the following expressions:

   (a)
   $$\frac{1}{x+1} - \frac{1}{x-1}$$

   (b)
   $$\left(1 + \frac{1}{x}\right) \div (x+1)$$

   (c)
   $$\left(1 + \frac{1}{x}\right) \div \left(1 - \frac{1}{x}\right)$$

3. Solve the following equations for x, and check your solution:

   (a) $\frac{x}{2} + 1 = \frac{4}{7}x$

   (b) $\frac{2}{3}x - \frac{1}{4} = \frac{1}{3}x + \frac{1}{2}$

   (c) $\frac{x}{2} - \frac{x}{3} = 8$

   (d) $\frac{x+1}{x+3} = 9$

   (e) $\frac{x-1}{3} - \frac{x-2}{4} = 1$

4. Solve the following equations containing absolute values, and plot on a number line:

   (a) $|x| = 7$.

   (b) $|x - 3| = 7$.

   (c) $|2x - 3| - 4 = 3$.

   (d) $|4x + 3| = 3 - x$.

   (e) $|2x - 12| = 4x$.

5. Solve and or plot the following inequalities on a number line:

   (a) $x > -1$ and $x < 2$.

   (b) $x \leq -4$ or $x \geq 4$.

   (c) $x^2 \leq 16$.

   (d) $|x - 5| \leq 3$.

6. Solve the following equations in **two variables** x and y, and check your solutions:

   (a) $x + y = 18$ and $x - y = 2$.

   (b) $y = 2x + 4$ and $y = 3x + 2$.

   (c) $2x - 2y = 8$ and $2x + 2y = 2$.

7. In the following problems, **write an algebraic equation** and then solve it.

   (a) Half a number plus 5 is 11. What is the number?

   (b) The sum of two numbers is 16. The difference is 4. What are the two numbers?

   (c) Right now Jane is 5 and her father is 42. In how many years will he be twice as old as her? (Write the number of years as x and write an equation for x).

   (d) A boy had a bag of apples. He gave 1/2 of them to his parents, 1/5 to his brother, 1/4 to his sister and the last he ate himself. How many apples did he originally have?