

SchoolNova, Math 5c
Homework 10
Algebra Review I
November 24, 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. Simplify the following expressions:

(a) $(xy)^3$

(b) $(x^2y^2)^3$

(c) $(x^2y^2)(x^5y^5)$

(d) $\frac{x^3y^3}{xy}$

(e) $(xy)^0$

(f) $\frac{(-x)^4}{(x)^4}$

(g) $\frac{(-x)^5}{(x)^5}$

2. Expand the following algebraic expressions, by opening the parenthesis and collecting like terms:

(a) $(a+b)(a+b)$

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

(c) $(a+b)^3$

(d) $(a+b)^4$

3. Compute the following expression:

$$\frac{1}{x} - \frac{1}{x+1}$$

4. * Compute:

$$\frac{1}{(1)(2)} + \frac{1}{(2)(3)} + \frac{1}{(3)(4)} + \cdots + \frac{1}{(9)(10)}$$

Hint: Use the result from the above problem.

5. * Compute:

$$\frac{1}{(1)(11)} + \frac{1}{(2)(12)} + \frac{1}{(3)(13)} + \cdots \frac{1}{(20)(30)}$$

Use a clever trick.

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?