SchoolNova, Math 5b Homework 7 Algebra with Fractions and Exponents November 4, 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. Simplify each of the following algebraic expressions, by opening the parenthesis and collecting like terms:
 - (a) a(a+b) + b(a+b)
 - (b) (a+b)(a+b)
 - (c) a(a+b) b(a+b)
 - (d) (a-b)(a+b)
 - (e) $(a+b)^2$
 - (f) $(a+b)^3$
 - (g) $(a+b+c)^2$
- 2. Solve the following equations for x:
 - (a) x + 2 = 6
 - (b) x 2 = 11
 - (c) 10 x = 4
 - (d) 2x + 18 = 20
 - (e) 4x = 24
 - (f) 2x + 6 = x + 10
- 3. Solve the following equations for x:
 - (a) $5^x = 25$
 - (b) $6^x = 1$
 - (c) $3^x = 3^2 3^3$
 - (d) $7^{2x} = 49$
 - (e) $4^x = 2^3$
 - (f) $(3^4)^x = 81 \times 3^6$
 - (g) $8 \times 2^{x+2} = 32$

- 4. Solve the following equations for x, and check your solution:
 - (a) $\frac{x}{5} = 4$
 - (b) $\frac{x+1}{3} = 8$
 - (c) $\frac{5}{8}x = 10$
 - (d) $\frac{1}{2}x = \frac{1}{4}x + 2$
 - (e) $\frac{x}{2} + \frac{x}{3} = 10$

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

- 5. * It is given that a + b = 10, b + c = 14 and a + c = 16. Find a + b + c.
- 6. * One can measure temperature using either the Fahrenheit scale or the Celsius scale. The relation between the two is given by

$$C = \frac{5}{9} \left(F - 32 \right)$$

- (a) Is there a temperature which gives the same value on both scales, that is F = C?
- (b) Is there a temperature, which in Fahrenheit scale is twice as large as Celsius, that is F = 2C?
- 7. In the following sequence of numbers, each number has one more 1 than the preceding number: 1, 11, 111, 1111, What is the tens digit of the sum of the first 30 numbers of the sequence?