**Math 8 – Assignment**

**Algebra and Linear/Non Linear Relations**

1. Give a description of each of the following terms. Give an example of each

a)Variable\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Expression \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c)Equation\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d)Polynomial\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e)Monomial, Binomial, Trinomial \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f)Like Terms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

g)Coeffients\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

h) Linear and Non Linear Relations \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Simplify** the following by collecting like terms and draw algebra tiles to represent each expressions;

a) 3*c* - 5 + 4*c* - 8 b) -6*y2* + 2*y* + *y2* - 7*y c)* 8*x* - 5*x* + 3 - 2*y* - *y* – 1

3. **Simplify** the following by collecting like terms;

a) *a* - 4*a b)* 17 - 3v2 - 6 - 19v + 8v2 - 16v c) 7x + 3x2 + 12

d) 5s – 4 – 3s + s -10 e) 4c2 -17c + 15 – 3 c – 7c2 – 6

f) 8xy – y3 + 3y4 + 9xy – 4y3 – 10y2  g) -10y + 15x- + 16y + 4x – 5 – 11

4. **Simplify** the following expressions using algebra tiles;

a) (6*x***2** – 3*x* + 2) + (2*x***2** + 4*x* – 5) b) (5*x***3** + 6*x***2** + 12) – (3*x***3** + 4*x***2** + 5*x* + 3)

5. **Simplify** the following expressions;

a) (6*x***2** – 3*x* + 2) + (2*x***2** + 4*x* – 5) b) (3*x***2** – 6) + (-*x***2** + 3*x* + 2)

c) (4*x***2** – 3*x* + 8) + (3*x***2** – 4*x* + 1) d) (9*x***2** + 2) – (–6*x***2** + 3*x* – 1)

e) (8*x***3** – 5*x***2** + *x* + 6) – (4*x***3** –6*x***2** – 10*x* + 1) f) (2*x***3** + 5*x***2** – 3*x* – 2) – (5*x***3** + 2*x***2** – 4*x* +7)

6. Draw an area model to **simplify** the following expressions;

a) 3(4*x*-3) b) 2(5+8*x*) c) 3(4x-2)

7. **Simplify** the following expressions

-5(4*x*-4) 3(2*x+*6) 7(*x*+1) 10(2*x*-10) -2(-6*x*+3) 6(-8*x*-9)

8. **Solve** for each variable in each question. **Show all your steps.**

a) X -13 = -27 b) a+ 83 = 127 c) -4x = 36 d) 35 =

e) 3x – 5= 10 f) x + 3 = 7 g) 4x- 5 = 7 h) 14 = 3x - 6

i) 1x – 8 = 12 j) -10 = x -8 k) 5x – 3 = 2x + 8 l) 3x – 10x = 15

m) -5x - 3 = -2x + 8 n) -3(x+2) = 15

9.. Write an **algebraic expression** from each word problem.

a) Jennifer has $26 less than triple the savings of Matthew. Write an expression to show how much Jennifer has saved.

Let *x* = Matthew’s savings

b) Harold has typed 14 more pages than Rebecca. Write an expression to show how many pages Harold has typed.

Let *y* = the number of pages Rebecca has typed

c) A field is 15 yards longer that twice its width. Write an expression to show how long the field is.

Let *w* = the width of the field

10. The perimeter of this triangle is 46 cm.



Write an equation for the perimeter of the triangle an solve for y.

11. Sara is saving for a ski trip. She has to double the amount she has in her savings and add another 21 dollars. If the ski trip cost 723 dollars, how much does she have in her savings account. Write the equation and solve.

12. Answer the questions based on the diagram below:



**a)** Complete the table of values for the first five terms.

|  |  |
| --- | --- |
| **Term (*n*)** | **Number of**  **Rectangles (*r*)** |
| **1** |  |
| **2** |  |
| **3** |  |
| **4** |  |
| **5** |  |

**b)** By how many rectangles is the pattern increasing from one term to the next? \_\_\_\_\_\_\_\_\_\_\_

**c)**Use the data in the table of values to graph the relation. Plot term on the horizontal axis and number of rectangles on the vertical axis. Should you join the points with a line? Explain.



**d)** Is this a linear relation? How do you know?

**e)** Describe in words how you can determine the number of rectangles if you know the term number.

**f)** Write an equation that relates the number of rectangles, r*,* and the term number, *n*.

**g)** Use the equation to determine how many rectangles will be in the

• 11th term • 20th term

**d)** Use the equation to determine which term has 183 rectangles.

13. Determine whether or not each relation is linear or non linear. Explain how you know.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | ***x*** | 0 | 1 | 2 | 3 | | ***y*** | 0.5 | 1 | 1.5. | 2 | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | ***x*** | 0 | 1 | 2 | 3 | | ***y*** | 3 | 7 | 12 | 18 | |