

# Math

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## 1 Problem 1

A polynomial is an expression with at least one variable. All powers in a polynomial must be non-negative integers. The degree of a polynomial is the degree of the term with the largest degree. The degree of a term is the exponents on the variables of the term added up.

For example the degree of the term  $3x^2$ , assuming  $x$  is a variable, would be 2 as  $x$  is the only variable and its exponent is 2. Similarly the degree of  $3x^2 + 5x + 2$  is 2 as  $3x^2$  is the term with the largest degree 2.

Another example is the term  $x^2y$ , assuming both  $x$  and  $y$  are variables, the degree of the term is 3 as the exponent of  $x$  is 2 and the exponent of  $y$  is 1.  $2 + 1$  is 3. Similarly the degree of  $2x^2y + x^2 + 2xy + 5$  is 3. As the degree of the largest term,  $2x^2y$  is 3.

## 2 Problem 2

The degree of  $ax^2 + x$  is 2 as the term with the largest degree is  $ax^2$ .

## 3 Problem 3

$a$  only affects the term  $ax^2$ , whereas  $x$  effects both terms.

## 4 Problem 4

$(0, 0)$  is special as its the vertex as well as the x and y intercepts

## 5 Problem 5

When  $a$  is positive, as  $a$  gets larger, any given point aside from  $(0, 0)$  gets closer to the line  $x = 0$ . When  $a$  is negative, as  $a$  gets smaller, any given point aside from  $(0, 0)$  gets closer to the line  $x = 0$ . When  $a$  is 0 it is just a straight line  $y = 0$