

## **What Exactly is a Polynomial Function ???**

The following is a list of criteria in order for a given relation to be classified as a **Polynomial Function**:

- 1) the relation is expressed in terms of one variable (i.e.  $x$  )
- 2) each term in the relation is a power with the variable as the base
- 3) the degree of each term is a whole number
- 4) the relation is a function
- 5) the domain of the relation is any real number
- 6) the range of the relation is any real number OR it may have an upper boundary or a lower boundary but not both
- 7) the relation cannot have any horizontal or vertical asymptotes

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On the reverse side of this page is a list of examples of polynomial functions and a list of examples of non-polynomial functions.

Identify why each of the non examples are not polynomial functions.

# Polynomial Concept Attainment Activity

Compare and contrast the examples and non-examples of polynomial functions below. Through reasoning, identify 3 attributes of every polynomial function that distinguish them from non-polynomial functions:

## Yes Examples

$$y = x$$

$$y = 2x - 1$$

$$y = -\frac{2}{5}x$$

$$y = x^2$$

$$y = (x - 2)^2 + 1$$

$$f(x) = -x^2 + x$$

$$y = -0.2(4x - 3)(x + 3)$$

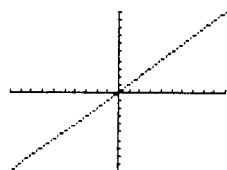
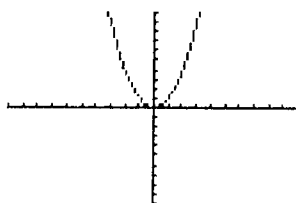
$$y = x^3 + 2x^2 - x + 11$$

$$y = 4$$

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

$$y = -4x^0 + 4$$

$$y = x(x^2 - 4)(x + 2)$$



## Non Examples

$$y = \sqrt{x}$$

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

$$x = -6$$

$$x^2 + y^2 = 16$$

$$h(x) = \sqrt[3]{x}$$

$$y = \sin \beta$$

$$y = \frac{1}{x-2}$$

$$y = 2^x$$

$$y = \frac{x-1}{x^2 - x + 1}$$

