

**Journal:**

What is the standard (slope/intercept) form for a linear function? What do  $m$  and  $b$  represent? What is the standard form for a quadratic function? What do the letters  $a$ ,  $b$  and  $c$  represent? What does the number 2 in the exponent tell you about the function?

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**Polynomials**

A polynomial is a certain type of function. Lines and parabolas are all polynomials.

Type	Function	Degree	Leading Coefficient
Linear			
Quadratic			
Cubic			
Quartic			

Degree –

Leading Coefficient –

Standard form –

These are NOT polynomials:

$$y = x^{-3}$$

$$y = x^{1/2}$$

$$y = 3^x$$

So, what makes a polynomial a polynomial?

A *term* is a \_\_\_\_\_ of a number called a \_\_\_\_\_, and a  
\_\_\_\_\_ to a \_\_\_\_\_ power. A *polynomial* is a \_\_\_\_\_ of terms.

### Homework:

1. Simplify the following. This means combine like terms and do any distribution needed. Your final answer should be in “standard form”.

a.  $(2x^2 + x + 5) + (3x - 2)$

b.  $(x^3 - 3x^2 + 4) - (2x^3 + x^2 - 3x + 1)$

c.  $x^2(x + 2)$

d.  $x(3x + 4) - 2x(x - 1)$

e.  $(2x - 3)^2$

f.  $-3x(2x^2 - 3x + 4x + x^2)$

g.  $(x^2 - 1)(2x + 7)$

h.  $2x(x - 5)(x + 3)$

i.  $(x + 2)(x - 2)(x + 3)$

j.  $(x - 1)^3$

k.  $2(x+3)^2 - 5(x-1)^2$

1.  $\left(\frac{4x^2 - 8}{2}\right)\left(\frac{3x - 12}{3}\right)$

2. Factor the following expressions. For many of these problems you will need to use more than one factoring method. Factoring methods include:

a) Factor out something all terms have in common. [Ex.  $2x^2 + 10x = 2x(x + 5)$ ]

b) Difference of squares. [Ex.:  $x^2 - 25 = (x - 5)(x + 5)$ ]

c) Factor the quadratic trinomial [Ex:  $x^2 + 4x + 3 = (x + 3)(x+1)$ ]

a.  $2x^2 - 50$

b.  $x^4 - 9x^2$

c.  $-2x^2 + 2x + 84$

d.  $x^2 - 12x - 45$

e.  $-x^2 - x + 56$

f.  $2x^2 - x - 21$

g.  $x^3 - x^2 - 90x$

h.  $x^4 - 2x^3 - 80x^2$

3. Identify the degree and leading coefficient for each part of problem 2 above.

a. b.

c. d.

e. f.

g. h.

### ANSWERS

1.a.  $2x^2 + 4x + 3$     b.  $-x^3 - 4x^2 + 3x + 3$     c.  $x^3 + 2x^2$     d.  $x^2 + 6x$     e.  $4x^2 - 12x + 9$

f.  $-9x^3 - 3x^2$     g.  $2x^3 + 7x^2 - 2x - 7$     h.  $2x^3 - 4x^2 - 30x$     i.  $x^3 + 3x^2 - 4x - 12$

j.  $x^3 - 3x^2 + 3x - 1$     k.  $-3x^2 + 22x + 13$     l.  $2x^3 - 8x^2 - 4x + 16$

2a.  $2(x + 5)(x - 5)$     b.  $x^2(x - 3)(x + 3)$     c.  $-2(x + 6)(x - 7)$     d.  $(x - 15)(x + 3)$

e.  $-1(x - 7)(x + 8)$     f.  $(2x - 7)(x + 3)$     g.  $x(x - 10)(x + 9)$     h.  $x^2(x + 8)(x - 10)$

3. a. 2, 2    b. 4, 1    c. 2, -2    d. 2, 1

e. 2, -1    f. 2, 2    g. 3, 1    h. 4, 1