

Graphing Polynomial Functions

Name: _____

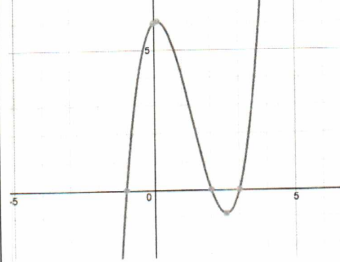
A third degree polynomial with x-intercepts -1, 2 and 3 has an equation

$P(x) = (x+1)(x-2)(x-3)$ (factored form)

or

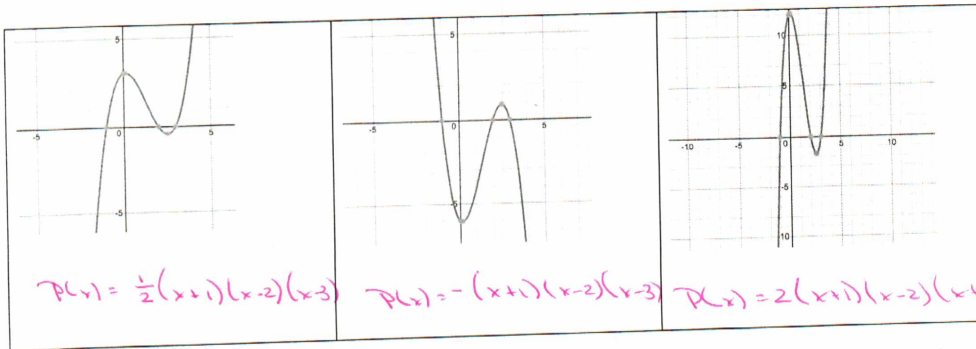
$P(x) = x^3 - 4x^2 + x + 6$ (expanded form)

The graph of the function is



This is NOT the only polynomial that satisfies the constraints.

1. **Compare** the three graphs below to the graph above. **Make one change** in the polynomial function that would generate the given graph. What remains constant?



Zeros are the same

2. For each polynomial state the degree, list the zeros and sketch a graph. Your graph should contain both x and y-intercepts. Use graph paper and adjust your scales accordingly.

a. $y = (x+2)^3$

D: 3
Z: -2 m. 3

b. $F(x) = (x-1)(x+1)(x+3)$

D: 3
Z: 1, -1, -3

c. $P(x) = (x-1)(x-4)(2x-1)$

D: 3
Z: 1, 4, 1/2

d. $P(x) = x^4 - 5x^2 + 4$

D: 4
Z: ±2, ±1

$P(x) = (x^2 - 4)(x^2 - 1)$
 $= (x+2)(x-2)(x+1)(x-1)$