

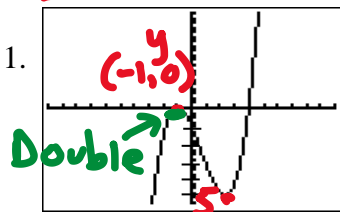
# 4.8 Graphing Polynomials

OBJ: To analyze the factored form of a polynomial and write a polynomial function from its zeros

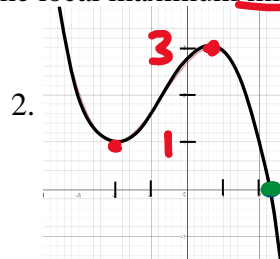
Chart of basic Parent Polynomial Functions					
Parent Function	$f(x) = x^2$	$f(x) = x^3$	$f(x) = x^4$	$f(x) = x^5$	$f(x) = x^n$
Degree					
Classification					
Picture ( $a > 0$ ) <u>W</u> ( $a < 0$ )					
# of Turning Points	<u>1</u>	<u>2</u>	<u>3</u>		

Local maximum - the highest y-value in a local region  
 1/1  
 Local minimum - the lowest y-value in a local region

Identify the a) degree, b) the number of turning points, c) the local maximum/minimum, and d) the number of real/imaginary solutions.

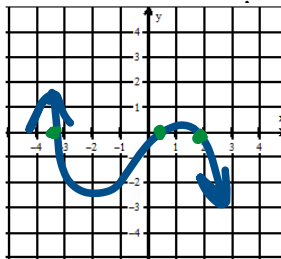
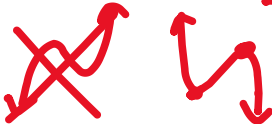


Deg = 3  
 TP = 2  
 LMax = 0  
 LMin = -5  
 Real = 3  
 Imag = 0

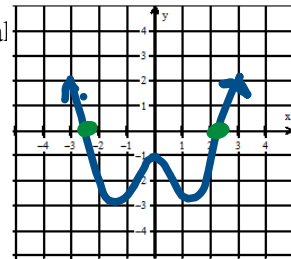


Deg = 3  
 TP = 2  
 LMax = 3  
 LMin = 1  
 Real = 1  
 Imag = 2

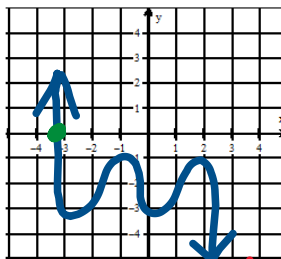
3. Sketch an odd degree polynomial, function with a negative leading coefficient, 1 relative maxima, 1 relative minima, and 3 real zeros.



4. Sketch an even degree polynomial function with a positive leading coefficient, 1 relative maxima, 2 relative minima, and 2 real zeros.

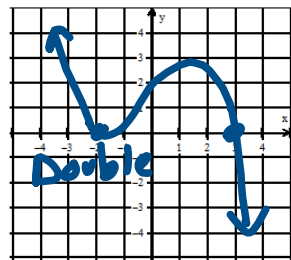


5. Sketch an odd degree polynomial, function with a negative leading coefficient, 2 relative maxima, 2 relative minima, and 1 real zero.



6. Graph  $y = -(x+2)^2(x-3)$

$x = -2$   $x = 3$   
 Double Root Cubic

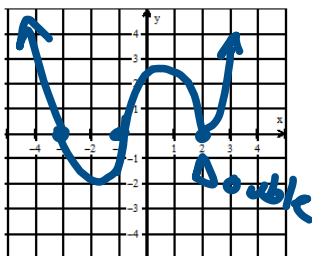


Write the factored form of each polynomial function. Find the zeros of each function. Graph the function.

7. Graph  $y = (x+1)(x+3)(x-2)^2$

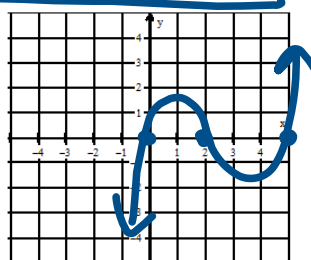
$x = -1$   $x = -3$   $x = 2$   
 Double

Quartic



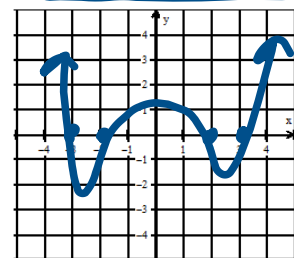
8.  $y = x^3 - 7x^2 + 10x$

$y = x(x^2 - 7x + 10)$   
 $y = x(x-5)(x-2)$   
 $x = 0, 5, 2$



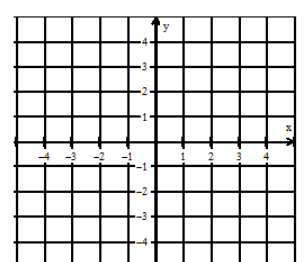
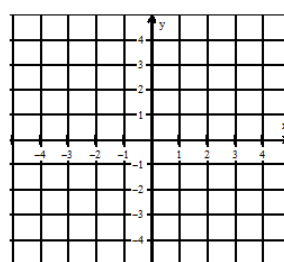
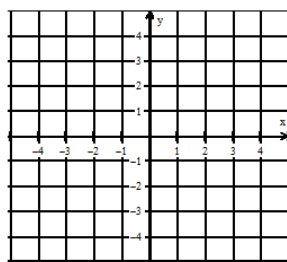
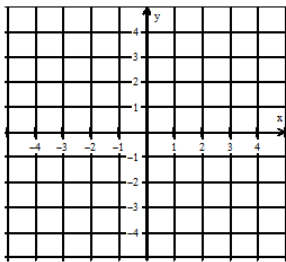
9.  $y = x^4 - 13x^2 + 36$

$x^2 \cdot x^2 - 9 \cdot -4$   
 $0 = (x^2 - 9)(x^2 - 4)$   
 $0 = (x-3)(x+3)(x+2)(x-2)$   
 $x = 3, -3, -2, 2$

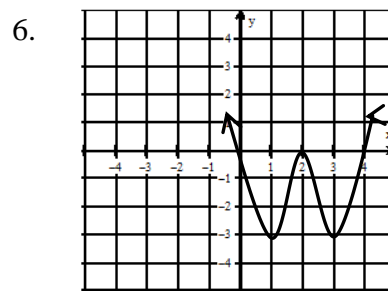
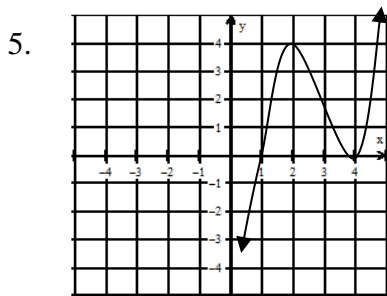


Write the function in factored form when necessary. Find the zeros and graph the function.

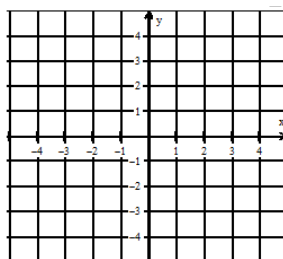
1.  $y=-(x+4)^2(x-1)$     2.  $y=x^3-x^2+7x-7$     3.  $y=-x^3+11x^2-24x$     4.  $y=x^4-5x^2+4$



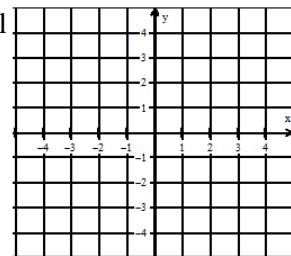
Identify the a) degree, b) the number of turning points, c) the local maximum/minimum, and d) the number of real/imaginary solutions.



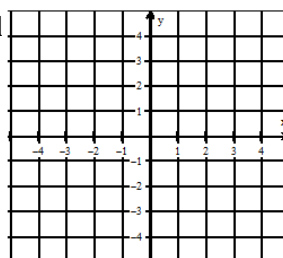
7. Sketch an odd degree polynomial, function with a negative leading coefficient, 2 relative maxima, 2 relative minima, and 3 real zeros.



8. Sketch an even degree polynomial function with a negative leading coefficient, 2 relative maxima, 1 relative minima, and 4 real zeros.



9. Sketch an even degree polynomial function with a positive leading coefficient, 1 relative maxima, 2 relative minima, and 4 real zeros.



10. What is a cubic equation with zeros  $3i$ ,  $-8$ ?

# Warm-Up

## **Complete the table on the notes**