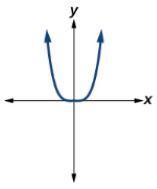
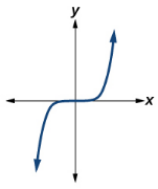
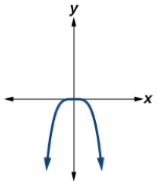
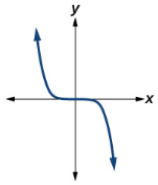
MATH 125 College Algebra OpenStax Name:_____Section_____

Section 5.3 Video Worksheet Professor _____

Graphs of Polynomial Functions

Polynomial function of the form $f(x)=a_nx^n+a_{n-1}x^{n-1}+\ldots+a_2x^2+a_1x+a_0$ have a domain of _____.

End Behaviour of a power function

	Even power	Odd power
Positive constant $k>0$	 $x\to-\infty, f(x)\to\infty$ and $x\to\infty, f(x)\to\infty$	 $x\to-\infty, f(x)\to-\infty$ and $x\to\infty, f(x)\to\infty$
Negative constant $k<0$	 $x\to-\infty, f(x)\to-\infty$ and $x\to\infty, f(x)\to-\infty$	 $x\to-\infty, f(x)\to\infty$ and $x\to\infty, f(x)\to-\infty$

Thus range of a polynomial is _____ if the degree is odd and _____ if the degree is even.

A polynomial of degree *n* will have at most _____ intercepts and _____ turning points.

Let *f* be a polynomial function. The intermediate value theorem states that if *f(a)* and *f(b)* have opposite signs, then there exists at least one value *c* between *a* and *b* for which _____.

x-intercepts set _____ and solve for _____ y-intercepts set _____ and solve for _____

The x-intercepts are the zeros of the polynomial and have multiplicity based on the degree of each factor. The multiplicity states if the graph is the same output on each side or if it is the opposite output on each side.

Find the zeroes for the polynomial function and give the multiplicity for each zero then graph the function. State the degree of the polynomial

$$f(x)=-2(x-1)\ (x-2)^2(x+3)^5(x+1)^6$$

Zeros					
Multiplicity					

$$f(x)=5x(x-3)^2(4-x)^3(x+2)$$

Zeros					
Multiplicity					

$y = -2x(3x+2)^2(16x^2-9)$

Zeros					
Multiplicity					

Use the intermediate value theorem to show that the polynomial has a real zero between 1 and 2.

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

Use the intermediate value theorem to show that the polynomial has a real zero between 0 and 1.

$f(x) = 3x^7 + 15x^2 - 8$

Find a nth-degree polynomial function with real coefficients satisfying the give conditions.

$n = 3;\ -1, 2 \text{ and } 3 \text{ are zeros; } f(1)=24$

Find a nth-degree polynomial function with real coefficients satisfying the give conditions.

$n = 4;\ 0(\text{double root}), 2 \text{ and } 3 \text{ are zeros; } f(4)=-16$