

Describe the characteristics of each polynomial. Use a graphing calculator to find characteristics that can't be found algebraically.

	$f(x) = 2x^3 - x$	$g(x) = -x^4 + 3x - 2$	$h(x) = 8x^6 - 4x^2 + 2$
Leading Coefficient	2	-1	8
Degree	3	4	6
Domain	$(-\infty, \infty)$	$(-\infty, \infty)$	$(-\infty, \infty)$
Range	$(-\infty, \infty)$	$(-\infty, .04]$	$[.91, \infty)$
Y-Intercept	$(0, 0)$	$(0, -2)$	$(0, 2)$
X-Intercepts	$(-.71, 0), (0, 0), (.71, 0)$	$(.81, 0), (1, 0)$	none
Maxima (abs. and rel.)	Rel. $(-.41, .27)$	Abs. $(.90, .04)$	Rel. $(0, 2)$
Minima (abs. and rel.)	Rel. $(.41, -.27)$	none	Abs. $(-.64, .91), (.64, .91)$
Intervals of Decrease	$(-.41, .41)$	$(.90, \infty)$	$(-\infty, -.64), (0, .64)$
Intervals of Increase	$(-\infty, -.41), (.41, \infty)$	$(-\infty, .90)$	$(-.64, 0), (.64, \infty)$
End Behavior	As $x \rightarrow -\infty, f(x) \rightarrow \infty$ As $x \rightarrow \infty, f(x) \rightarrow -\infty$	As $x \rightarrow -\infty, g(x) \rightarrow -\infty$ As $x \rightarrow \infty, g(x) \rightarrow -\infty$	As $x \rightarrow -\infty, h(x) \rightarrow \infty$ As $x \rightarrow \infty, h(x) \rightarrow \infty$
Symmetry	odd	neither	even

Perform the following transformations and write the new polynomial. Then, describe the function characteristics.

	$f(x-2) + 1$	$-g(x+1)$	$.5h(x-3) - 4$
New Polynomial	$2(x-2)^3 - (x-2) + 1$ $2x^3 - 12x^2 + 23x - 13$	$-[-(x+1)^4 + 3(x+1) - 2]$ $x^4 + 4x^3 + 6x^2 + x$	$.5[8(x-3)^6 - 4(x-3)^2 + 2] - 4$ $4x^6 - 72x^5 + 540x^4 - 2160x^3 + 4858x^2 - 5820x + 2895$
Transformation(s)	shift right 2 and up 1	reflect over x-axis shift left 1	v. comp. by .5, shift right 3 and down 4
Leading Coefficient	2	1	4
Degree	3	4	6
Domain	$(-\infty, \infty)$	$(-\infty, \infty)$	$(-\infty, \infty)$
Range	$(-\infty, \infty)$	$[-.04, \infty)$	$[-3.54, \infty)$
Y-Intercept	$(0, -13)$	$(0, 0)$	$(0, 2895)$
X-Intercepts	$(1, 0)$	$(-.19, 0), (0, 0)$	$(1.96, 0), (4.04, 0)$
Maxima (abs. and rel.)	Rel. $(1.59, 1.27)$	NONE	Rel. $(3, -3)$
Minima (abs. and rel.)	Rel. $(2.41, -.73)$	Abs. $(-.10, -.04)$	Abs. $(2.36, -3.54), (3.64, -3.54)$
Intervals of Decrease	$(1.59, 2.41)$	$(-\infty, -.10)$	$(-\infty, 2.36), (3, 3.64)$
Intervals of Increase	$(-\infty, 1.59), (2.41, \infty)$	$(-.10, \infty)$	$(2.36, 3), (3.64, \infty)$
End Behavior	As $x \rightarrow -\infty, y \rightarrow -\infty$ As $x \rightarrow \infty, y \rightarrow \infty$	As $x \rightarrow -\infty, y \rightarrow +\infty$ As $x \rightarrow \infty, y \rightarrow +\infty$	As $x \rightarrow -\infty, y \rightarrow \infty$ As $x \rightarrow \infty, y \rightarrow \infty$
Symmetry	NEITHER	NEITHER	NEITHER