

College Algebra
 Chapter 2: Finding zeros, extrema, & end behavior

Name Key
 Date: _____ Period: _____

Find the following information for each function, then graph.

1.) $f(x) = x^2 - 4x$

Degree 2

Zero(s): $x=0$ $x=4$

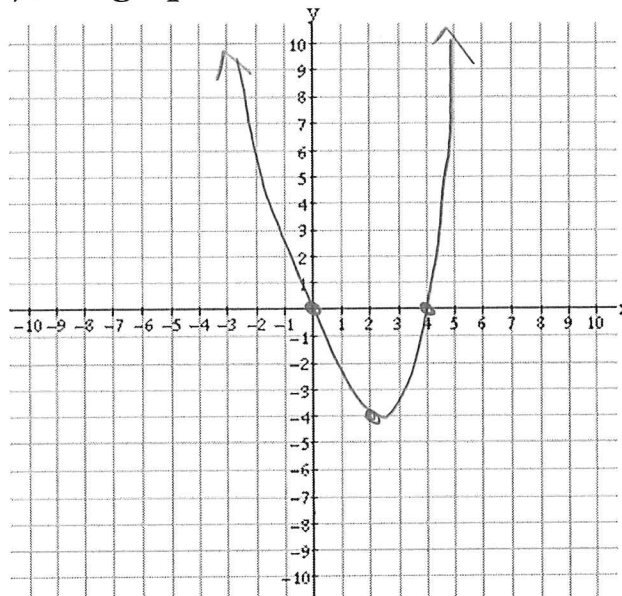
Relative Max: none

Relative Min: $(2, -4)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow \infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow \infty$

Domain: $(-\infty, \infty)$

Range: $[-4, \infty)$



2.) $f(x) = x^3 + 4x^2 + x - 6$

Degree 3

Zero(s): $x=-3$ $x=-2$ $x=1$

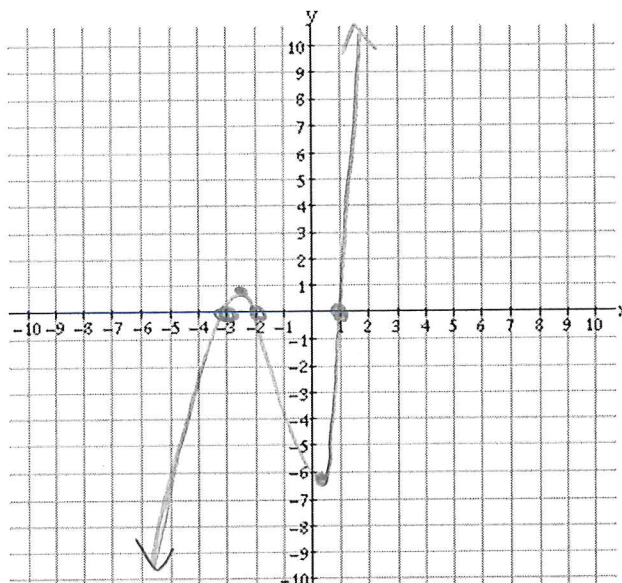
Relative Max: $(-2.5, 0.9)$

Relative Min: $(-0.1, -6.1)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow \infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$



3.) $f(x) = -\frac{1}{2}x^4 + 2x^2$

Degree 4

Zero(s): $x=-2$ $x=2$ $x=0$ $x=0$ *

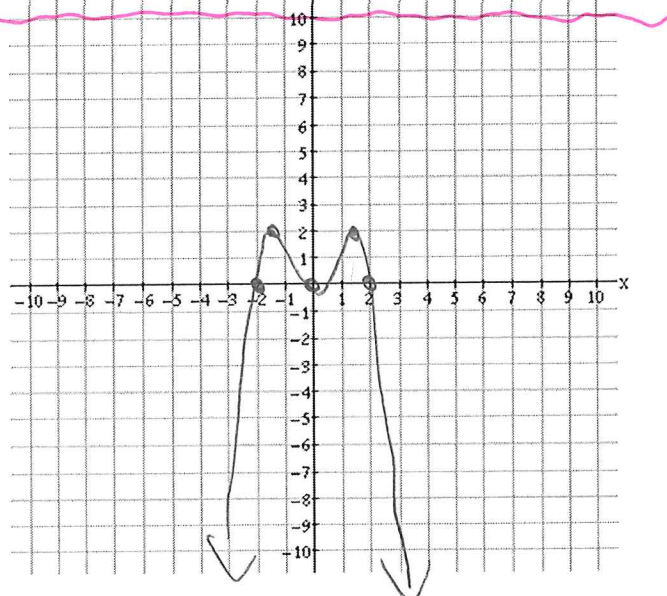
Relative Max: $(-1.4, 2)$ $(1.4, 2)$

Relative Min: $(0, 0)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow -\infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 2]$



4.) $f(x) = -x^2 + 6x - 9$

Degree 2 *

Zero(s): $x=3$ $x=3$

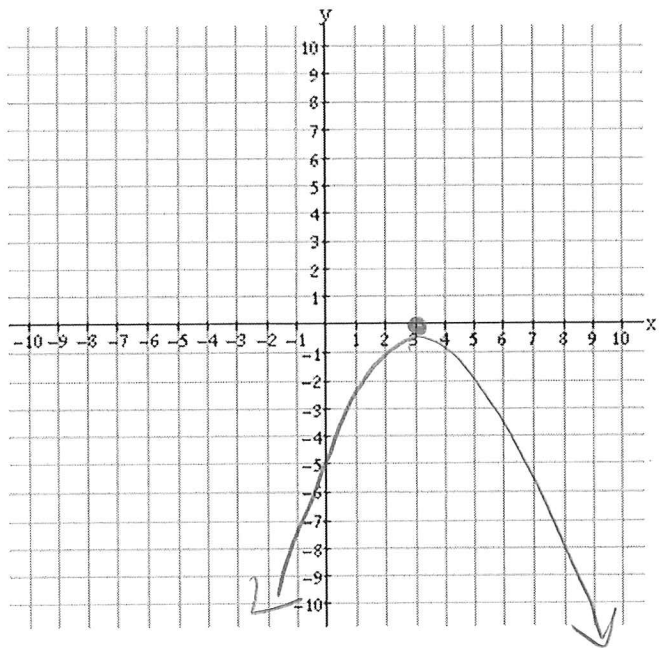
Relative Max: $(3, 0)$

Relative Min: none

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow -\infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 0]$



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

Degree 4

Zero(s): $x = -1.73$ $x = 1.73$ $x = 0$ $x = 0$ *

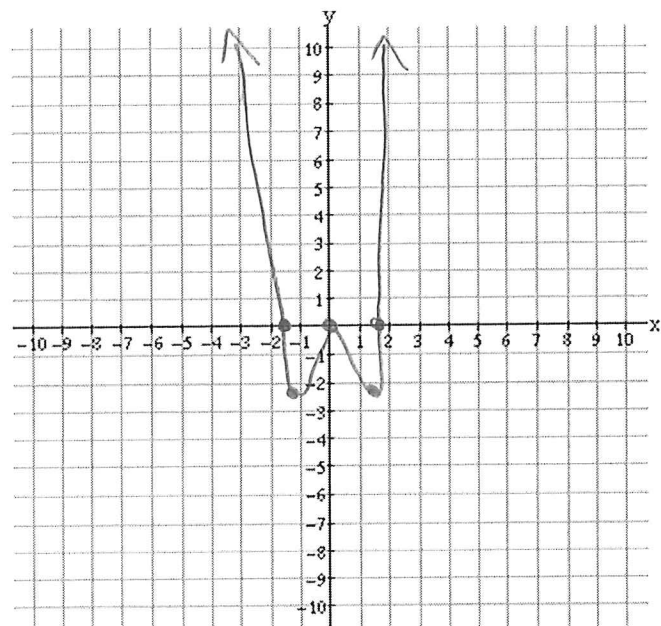
Relative Max: $(0, 0)$

Relative Min: $(-1.2, -2.3)$ $(1.2, -2.3)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow \infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow \infty$

Domain: $(-\infty, \infty)$

Range: $[-2.3, \infty)$



6.) $f(x) = 2x^3 - x^2 - 8x + 4$

Degree 3

Zero(s): $x = -2$ $x = 2$ $x = 0.5$

Relative Max: $(1.3, -3.7)$

Relative Min: $(-1, 9)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow \infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

