Function Characteristics Practice Problems

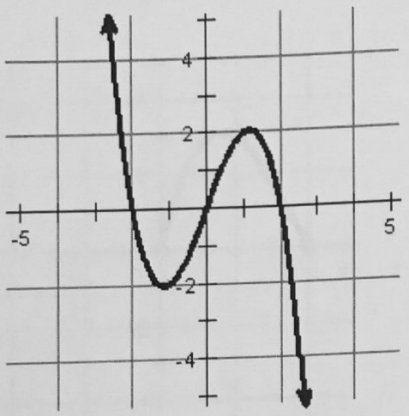
Name _____

Period _____ Date _____

For each graph, determine the following:

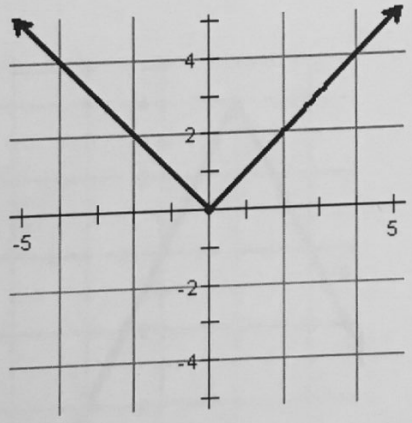
The domain and range of the function.
The intervals of x on which $f(x)$ is increasing and decreasing, if any.
The maximum and minimum values (absolute and/or local), if any.
The x- and y-intercepts, if any.
The function's end behavior.

Example



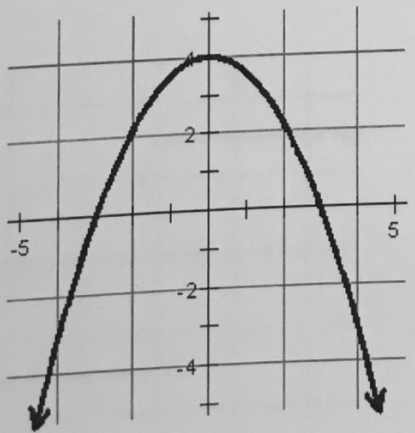
Domain? $(-\infty, \infty)$
Range? $(-\infty, \infty)$
Interval(s) of increase? $(-1, 1)$
Interval(s) of decrease? $(-\infty, -1) \cup (1, \infty)$
Maximum(s)? $(1, 2)$
Minimum(s)? $(-1, -2)$
x-intercept(s)? $(-2, 0)$ $(0, 0)$ $(2, 0)$
y-intercept(s)? $(0, 0)$
End behavior: $f(x) \to \infty$ as $x \to -\infty$
$f(x) \to -\infty$ as $x \to +\infty$

1.



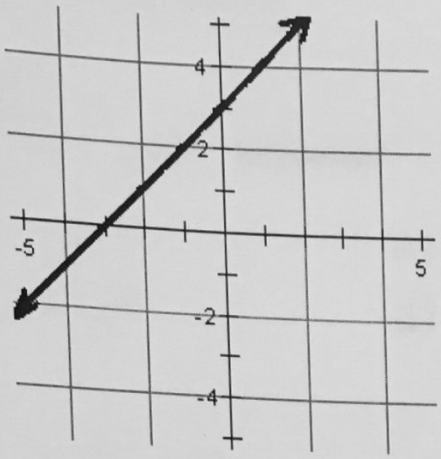
Domain? $(-\infty, \infty)$
Range? $[0, \infty)$
Interval(s) of increase? $(0, \infty)$
Interval(s) of decrease? $(-\infty, 0)$
Maximum(s)? none
Minimum(s)? $(0, 0)$
x-intercept(s)? $(0, 0)$
y-intercept(s)? $(0, 0)$
End behavior: $f(x) \to \infty$ as $x \to -\infty$
$f(x) \to \infty$ as $x \to +\infty$

2.



Domain? $(-\infty, \infty)$
Range? $(-\infty, 4]$
Interval(s) of increase? $(-\infty, 0)$
Interval(s) of decrease? $(0, \infty)$
Maximum(s)? $(0, 4)$
Minimum(s)? none
x-intercept(s)? $(-3, 0)$ $(3, 0)$
y-intercept(s)? $(0, 4)$
End behavior: $f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to -\infty$ as $x \to +\infty$

3.



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

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

Interval(s) of increase? $(-\infty, \infty)$

Interval(s) of decrease? none

Maximum(s)? none

Minimum(s)? none

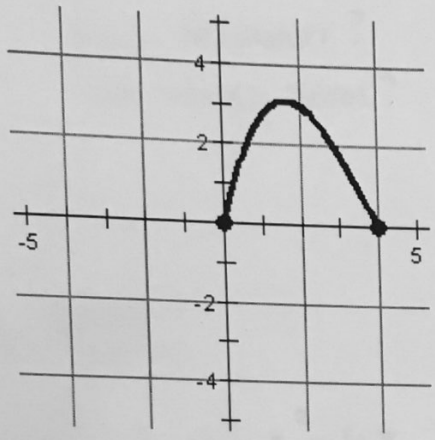
x-intercept(s)? $(-3, 0)$

y-intercept(s)? $(0, 3)$

End behavior: $f(x) \to \underline{-\infty}$ as $x \to -\infty$

$f(x) \to \underline{\infty}$ as $x \to +\infty$

4.



Domain? $[0, 4]$

Range? $[0, 3]$

Interval(s) of increase? $(0, 2.5)$

Interval(s) of decrease? $(2.5, 4)$

Maximum(s)? $(2.5, 3)$

Minimum(s)? $(0, 0)$ $(4, 0)$

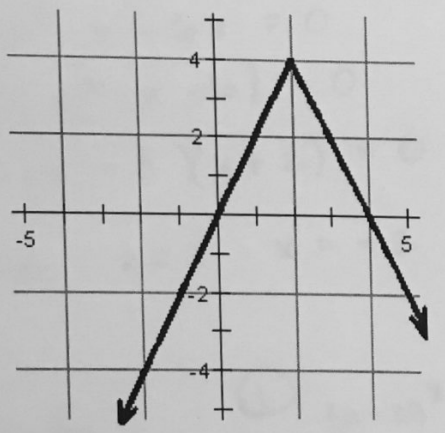
x-intercept(s)? $(0, 0)$ $(4, 0)$

y-intercept(s)? $(0, 0)$

End behavior: $f(x) \to \underline{0}$ as $x \to -\infty$

$f(x) \to \underline{0}$ as $x \to +\infty$

5.



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

Range? $(-\infty, 4]$

Interval(s) of increase? $(-\infty, 2)$

Interval(s) of decrease? $(2, \infty)$

Maximum(s)? $(2, 4)$

Minimum(s)? none

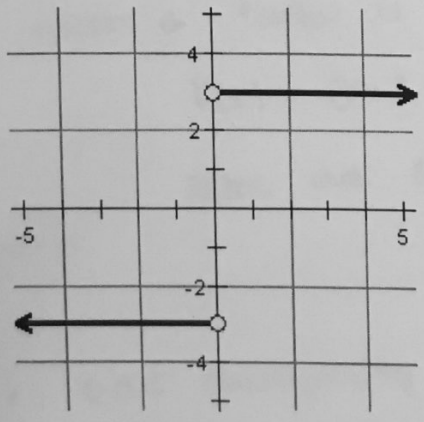
x-intercept(s)? $(0, 0)$ $(4, 0)$

y-intercept(s)? $(0, 0)$

End behavior: $f(x) \to \underline{-\infty}$ as $x \to -\infty$

$f(x) \to \underline{-\infty}$ as $x \to +\infty$

6.



Domain? $(-\infty, 0) \cup (0, \infty)$

Range? $(-3) \cup (3)$

Interval(s) of increase? none

Interval(s) of decrease? none

Maximum(s)? infinite # of points

Minimum(s)? infinite # of points

x-intercept(s)? none

y-intercept(s)? none

End behavior: $f(x) \to \underline{-3}$ as $x \to -\infty$

$f(x) \to \underline{3}$ as $x \to +\infty$