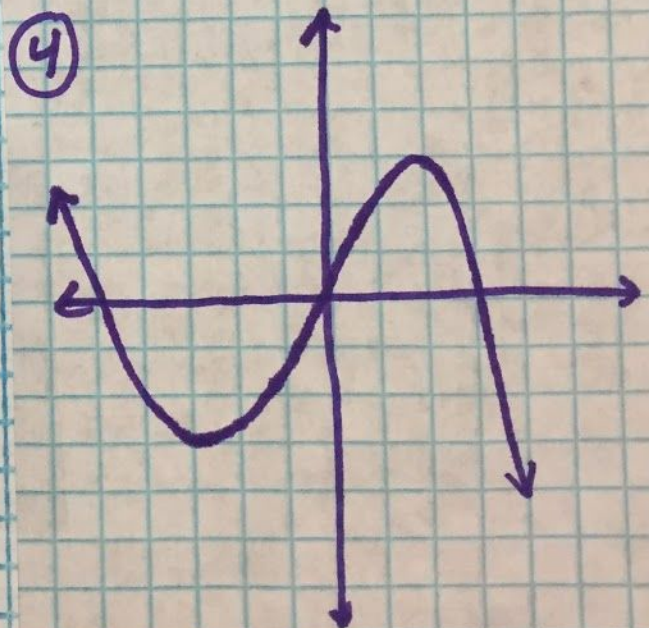
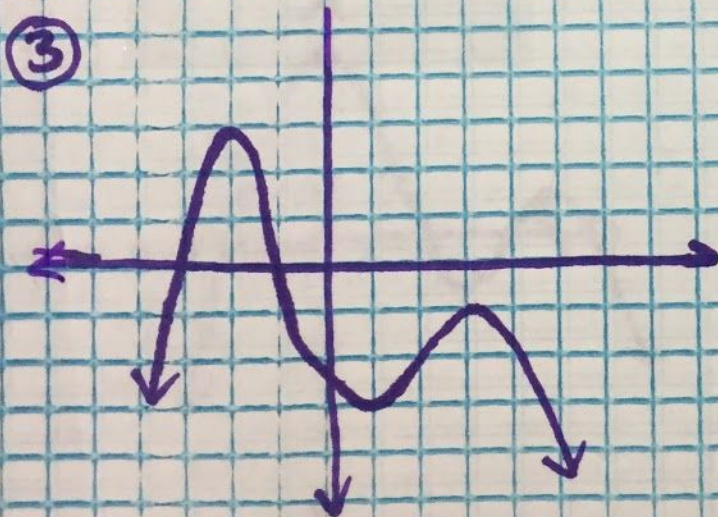
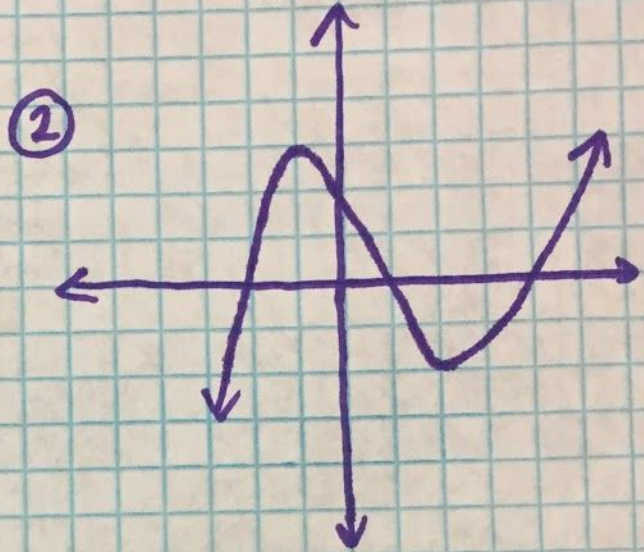
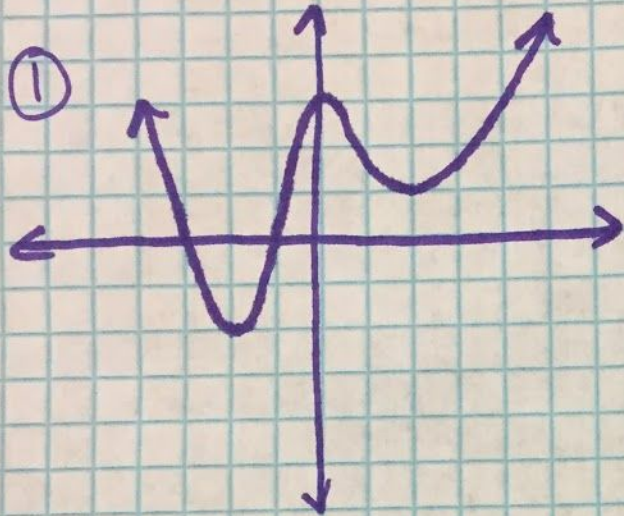


Describe local/absolute min/max, end behavior,  $f(x) > 0$ ,  $f(x) < 0$ ,  $f(x)$  inc/dec



## Answer Key

1. Absolute Minimum:  $(-2, -2)$

Local Minimum:  $(2, 1)$

Local Maximum:  $(0, 3)$

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

$f(x) > 0$  when  $x < -3, x > -1$

$f(x) < 0$  when  $-3 < x < -1$

$f(x)$  increasing when  $-2 < x < 0, x > 2$

$f(x)$  decreasing when  $x < -2, 0 < x < 2$

2. Local Minimum:  $(2, -2)$

Local Maximum:  $(-1, 3)$

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

$f(x) > 0$  when  $-2 < x < 1, x > 4$

$f(x) < 0$  when  $x < -2, 1 < x < 4$

$f(x)$  increasing when  $x < -1, x > 2$

$f(x)$  decreasing when  $-1 < x < 2$

3. Absolute Maximum:  $(-2, 3)$

Local Minimum:  $(1, -3)$

Local Maximum:  $(3, -1)$

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

$f(x) > 0$  when  $-3 < x < -1$

$f(x) < 0$  when  $x < -3, x > -1$

$f(x)$  increasing when  $x < -2, 1 < x < 3$

$f(x)$  decreasing when  $-2 < x < 1, x > 3$

4. Local Minimum:  $(3, -3)$

Local Maximum:  $(2, 3)$

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

$f(x) > 0$  when  $x < -5, 0 < x < 3$

$f(x) < 0$  when  $-5 < x < 0, x > 3$

$f(x)$  increasing when  $-3 < x < 2$

$f(x)$  decreasing when  $x < -3, x > 2$