

7.2

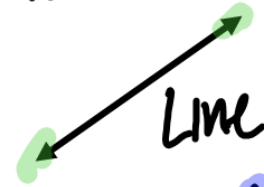
Constant

$$y = 3$$


 Horizontal line

Linear

$$y = 2x + 1$$


 Line

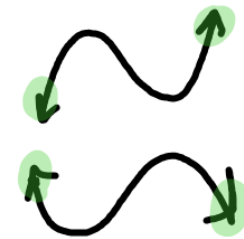
Quadratic

$$y = x^2 + 3$$


 Parabola
U Shape

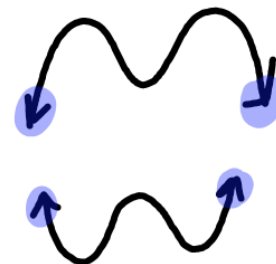
Cubic

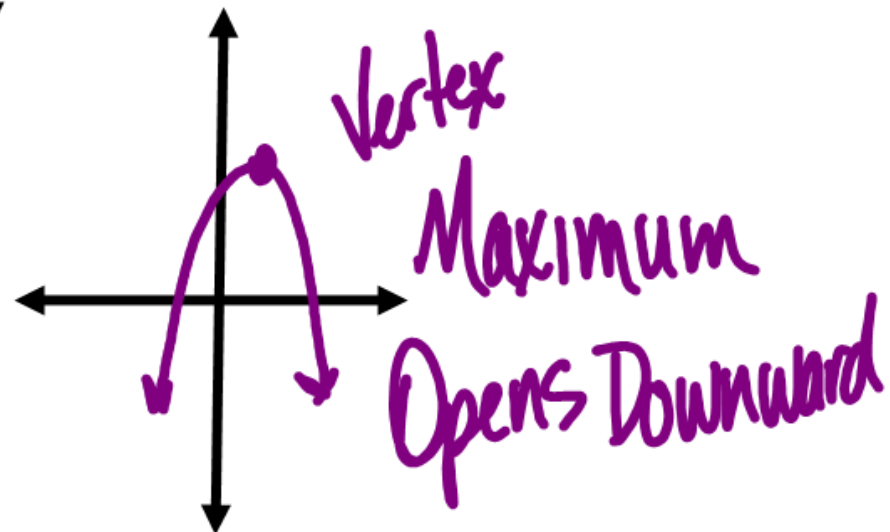
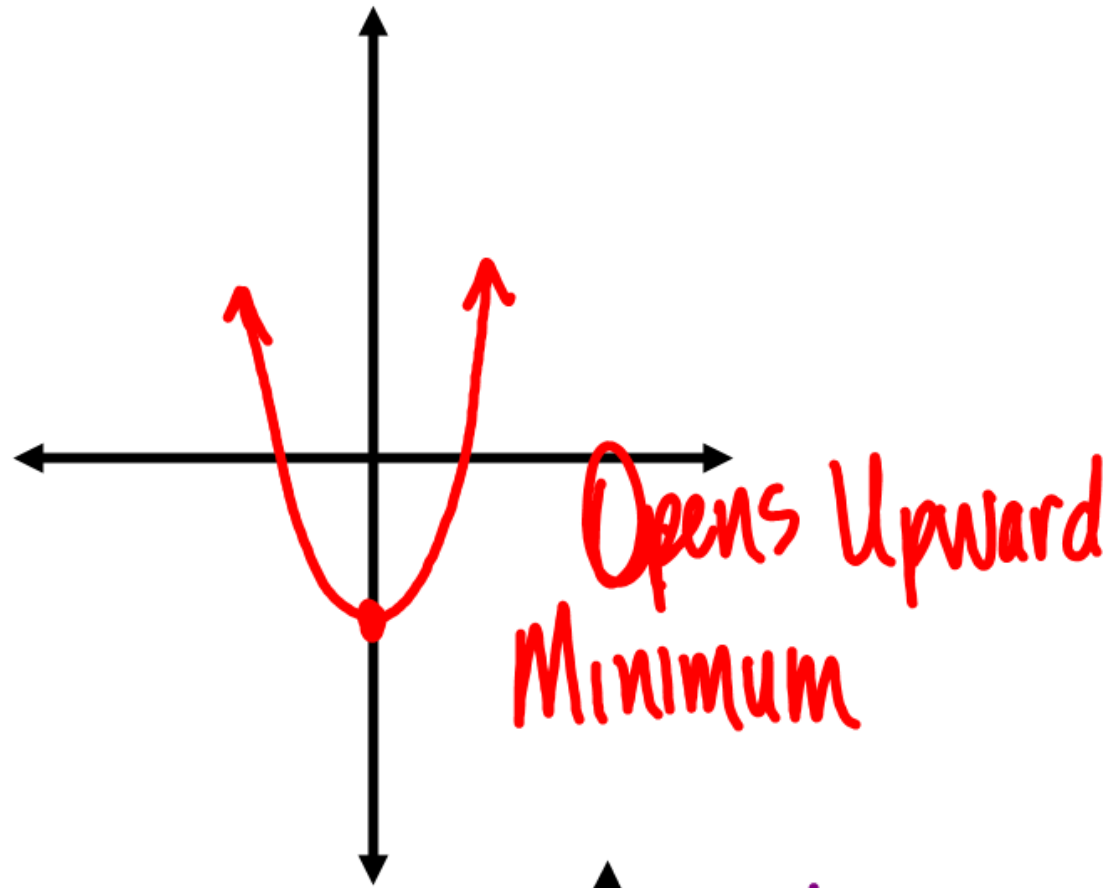
$$y = x^3 - 8$$



Quartic

$$y = x^4 + 3x - 2$$



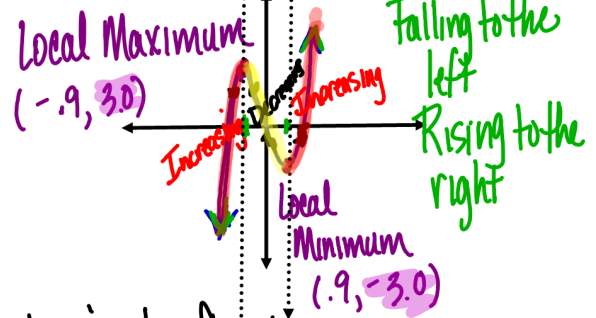


$$P(x) = 2x^3 - 5x$$

Opposite end behavior
cubic x^3 add

$$y = 2x^3 - 5x$$

End Behavior
use arrows means



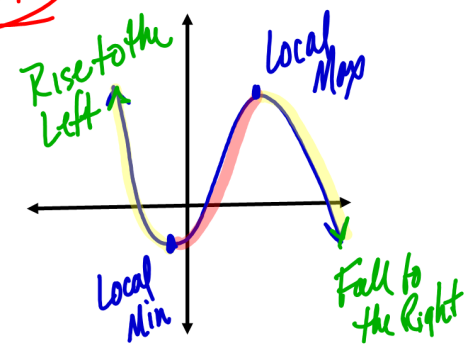
Use x 's values from local min/max and $\pm \infty$

Increasing from $-\infty$ to -0.9
 $x < -0.9$

Decreasing from -0.9 to 0.9
 $-0.9 < x < 0.9$

Trace with pencil


from 0.9 to ∞
 $x > 0.9$




$$f(x) = ax^n + \dots$$

$$2x^3 - 5x$$

n is odd

leading coefficient a is > 0 positive
 fall left
 rise right

$y = -2x^3 - 5x$ a is < 0 negative
 rise left
 fall right

$$f(x) = ax^n + \dots$$

n is even



$a > 0$ positive

Same end behavior

rise left
 rise right

$$y = 4x^2 + 3x + 1$$

$a < 0$ negative

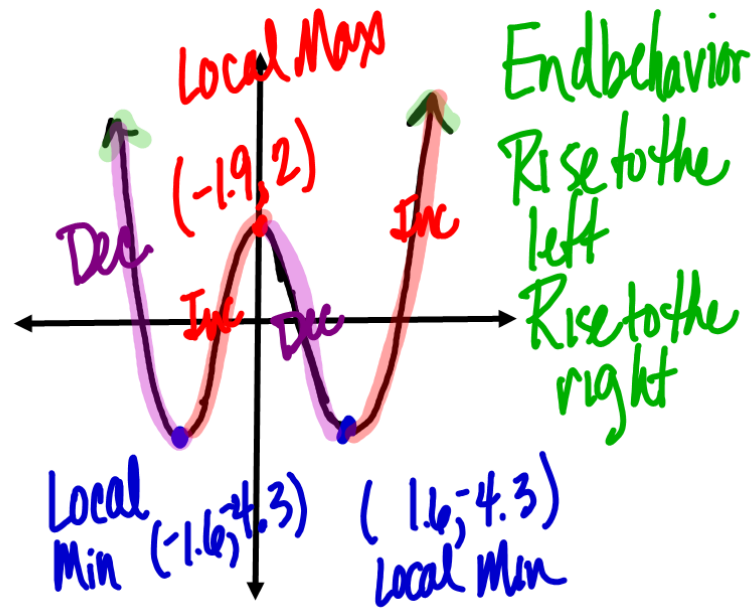


$$y = -x^2 + 2$$

fall left
 fall right

$$P(x) = x^4 - 5x^2 + 2$$

$$y = x^4 - 5x^2 + 2$$



Decreasing $-\infty < x < -1.6$ or $x < -1.6$

$$-1.9 < x < 1.6$$

Increasing $-1.9 < x < 1.6$

$$x > 1.6$$

$$1.6 < x < \infty$$