

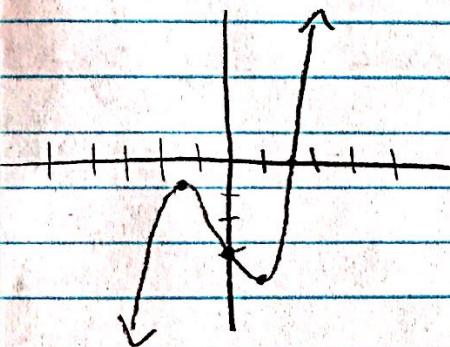
End Behavior Day 4

End Behavior: a description of the y -values as x becomes large in the positive and negative direction
(x approaches $+\infty$ or $-\infty$)

Notation • $x \rightarrow -\infty, y \rightarrow$ (left side)
• $x \rightarrow \infty, y \rightarrow$ (right side)

End Behavior of odd Degree graphs

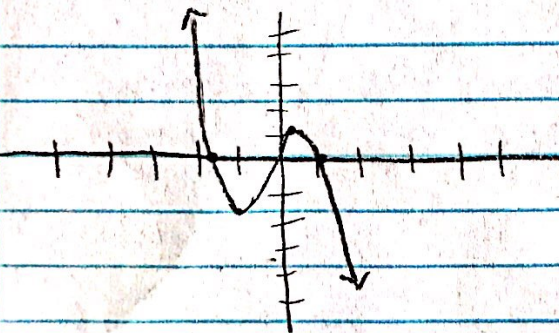
ex1 $f(x) = x^3 + x^2 - 2x - 3$



$$x \rightarrow -\infty, y \rightarrow \underline{-\infty}$$

$$x \rightarrow \infty, y \rightarrow \underline{\infty}$$

ex2 $-x^5 + x^4 - 4x^2 + x + 1$



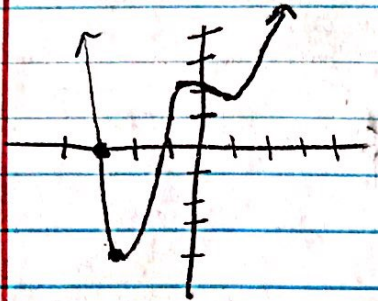
$$x \rightarrow -\infty, y \rightarrow \underline{\infty}$$

$$x \rightarrow \infty, y \rightarrow \underline{-\infty}$$

- * The end behavior for odd functions will either be $\uparrow\downarrow$ or $\downarrow\uparrow$
- * if the function is negative the right side of the graph will be \downarrow , if positive right side \uparrow

End Behavior of Even Degree graphs

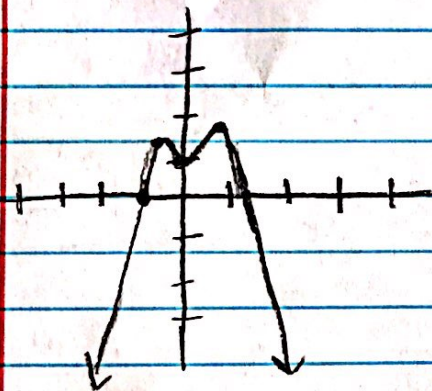
ex3 $P(x) = x^4 + 3x^3 - x + 2$



$$x \rightarrow -\infty, y \rightarrow \infty$$

$$x \rightarrow \infty, y \rightarrow \infty$$

ex4 $y = -2x^6 + x^3 + 2x^2 + 1$



$$x \rightarrow -\infty, y \rightarrow -\infty$$

$$x \rightarrow \infty, y \rightarrow -\infty$$

* The end behavior of an even function will either be $\uparrow\uparrow$ or $\downarrow\downarrow$

* When the function is negative, the end behavior will approach $-\infty$ on both sides

You try

1 $y = x^3 - 3x^2 - 3x + 9$

2 $y = -2x^4 + 7x^2 - 6$

3 $y = -3x^3 + x^2 - 10x + 5$

4 $y = 8x^4 + 11x^3 + 5x^2$