

Mth 30, Homework 5 on sections 3.3, 3.4

Due by Wed, Mar 6.

Please use lots of space and explain your answers, showing clearly any work you had to do. Each question is worth 3 points.

- (1) For the power function $f(x) = -2x^3$,
- (a) Compute $f(10)$ and $f(100)$, showing the behavior going right.
 - (b) Compute $f(-10)$ and $f(-100)$, showing the behavior going left.
- (2) For the same $f(x) = -2x^3$, fill in the blanks describing its end behavior:
- (a) As $x \rightarrow \infty$, $f(x) \rightarrow \underline{\hspace{2cm}}$.
 - (b) As $x \rightarrow -\infty$, $f(x) \rightarrow \underline{\hspace{2cm}}$.
- (Hint: your answers here should be ∞ or $-\infty$ and should match Question 1.)
- (3) Give the end behavior of $g(x) = 12x^4 - 4x + 7$ by drawing the arrows that show the direction of the graph going left and right.
- (4) Find the x and y intercepts and end behavior of $f(x) = -2x(x - 2)(x + 5)$ and use this information to sketch its graph. Make sure to label and number the axes.
- (Hint: there are three x intercepts.)
- (5) Find the x intercepts of $h(x) = 2x^4 - 8x^3 + 6x^2$
- (Hint: to factor $h(x)$ take out the gcd first)
- (6) Find the zeros of $f(x) = x^3 + 2x^2 - 9x - 18$
- (Hint: The zeros are just another name for the x intercepts. Factor by grouping.)
- (7) For $g(x) = (2x + 1)^3(9x^2 - 6x + 1)$ use factoring to explain why its zeros are just $-1/2$ and $1/3$ and give their multiplicities.
- (8) Sketch the graph of $h(x) = (x + 3)^2(x - 2)$ after finding its end behavior, intercepts and multiplicities of zeros. Make sure to label and number the axes.
- (Remember that if the multiplicity is even then the graph does not cross the x -axis there.)

If you get stuck on a question or aren't sure if you understand it:

- Go over the relevant class notes and section in the textbook.
- Check if you get the right answer for a similar odd-numbered question in the textbook (answers at the back of the book).
- Ask me about it after class.
- Come to my office hours: Mon 12:00 - 1:00, Wed 12:00 - 1:00 in CP 317.
- Go to the Math Tutorial Lab in-person in CP 303 or online.