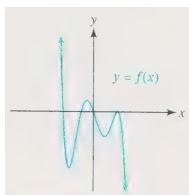


Complete as many of the following problems as you can with your group. You do not have to go in order. Each group will be given a specific problem that they must complete and present to either Professor MG or to Stefanie before they leave.

- (1) Consider the following graph of a function f



- (a) How many turning points are there? How many x -intercepts?
- (b) Is the leading coefficient positive or negative? Is the degree odd or even?
- (c) Describe the end behavior

Solution

- (a) A turning point occurs when the graph changes from increasing to decreasing or from decreasing to increasing. There are 4 on this graph. There are 4 x -intercepts as well.
- (b) The end behavior of the graph shows that it's an odd degree graph with a negative leading coefficient
- (c) The graph rises on the left and falls on the right

□

- (2) Without graphing $f(x) = 2 + 3x - 3x^2 - 2x^3$, answer the following:

- (a) What is the degree of the polynomial and what is the leading coefficient?
- (b) What is the end behavior of the graph?

Solution

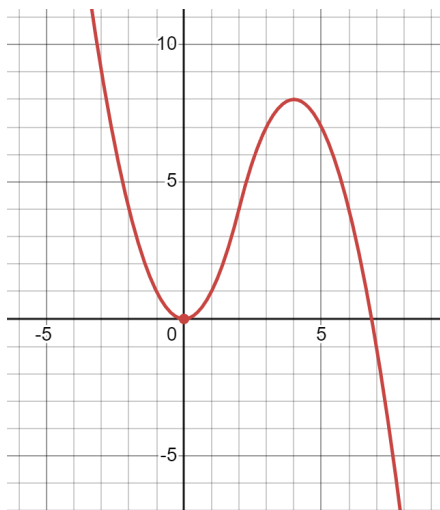
- (a) 3 and -2
- (b) Approaches ∞ (rises) to the left and approaches $-\infty$ (falls) to the right

□

(3) Sketch a graph that satisfies all of the following:

- The graph has an x and y intercept at $(0,0)$
- The graph is increasing on $(0,4)$ and decreasing on $(-\infty,0), (4,\infty)$
- The graph is concave down on $(2,\infty)$ and concave up on $(-\infty,2)$

Solution There are many possible answers. Here is one of them:

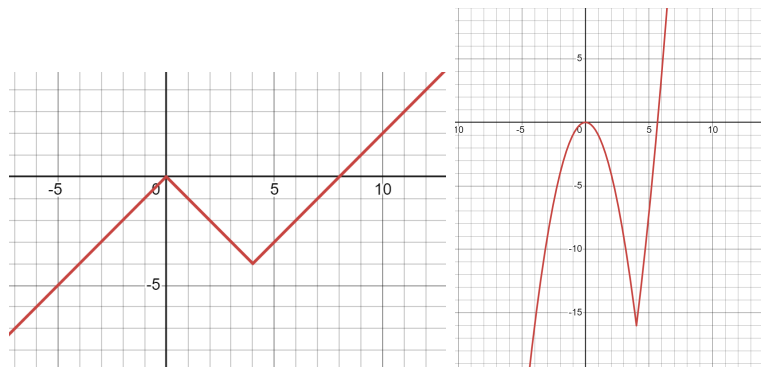


□

(4) Sketch two different graphs that both satisfies all of the following:

- Increasing on $(-\infty,0), (4,6),$ and $(6,\infty)$
- Decreasing on $(0,4)$

Solution There are many graphs that work. Here are two of them

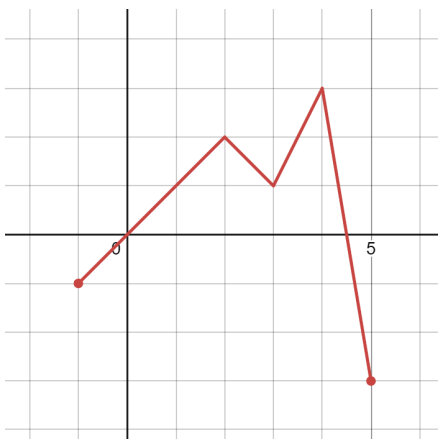


□

(5) Sketch a graph that satisfies all of the following:

- Absolute maximum at $x = 4$
- Local maximum at $x = 2$
- Absolute minimum at $x = 5$
- Local minimum at $x = 3$

Solution There are many possible answers. Here is one of them:



□

Key:

- (1) (a) Four turning points, 4 x-intercepts (b) Approaches ∞ (rises) to the left and approaches $-\infty$ (falls) to the right
- (b) $a < 0$
- (c) f approaches ∞ (rises) on the left and $-\infty$ (falls) on the right (3) Many answers
- (4) Many answers
- (2) (a) 3 and -2 (5) Many answers