

## Algebra 2 Topic 4 Review Fall 2019

The following is some review for the Topic 4 Test.

1. Use this function:  $y = 0.5x^4 - 2x^3 - 1.5x^2 + 6x + 2$

a) State the coordinates of all Absolute Max, Absolute Min, Relative Max, and Relative Min, if any. Round to the nearest hundredth as necessary.

b) State all intervals of increasing and decreasing.

2. Determine graphically if this function is probably ODD, EVEN, or NEITHER. Explain why you picked the answer that you did.  $f(x) = 2x(x^2 - 4)(x^2 - 1)$

3. Determine numerically if this function is probably ODD, EVEN, or NEITHER. Show work to justify your answer.  $y = \sqrt[3]{x^2 - 1}$

4. Determine algebraically if this function is ODD, EVEN, or NEITHER. Show work to justify your answer.  $f(x) = 6x^4 + 2x - 8$

5. Determine by any method if each function is ODD, EVEN, or NEITHER. Don't use the same method on all of the questions. On the test you'll be asked to state the method used and to justify your answer with any necessary work or explanation.

a)  $y = \frac{5x}{x^2 + 0.1}$

b)  $f(x) = -3|x^5 + x^3| - 2$

c)  $y = \frac{x^3 - 1}{x^2}$

d)  $f(x) = -7x^4 + x^2 - 21$

6. Use the given information to sketch and label the polynomial. Locate all known points on the graph.

-Increases on the following intervals:  $(-\infty, -2) \cup (1, 5)$

-Decreases on the following intervals:  $(-2, 1) \cup (5, \infty)$

-Passes through the origin

-Absolute maximum value of 6 in the first quadrant

-Relative minimum value of -2

-Relative maximum value of 4

7. A hot air balloon is taking people for rides. The following equation gives the balloon's altitude (in feet) as a function of time (minutes).  $h(t) = x^3 - 24x^2 + 144x$

a) Find the rate of change on the following interval and describe what it means in this situation.  $1 \leq t \leq 3$

b) Find the rate of change on the following interval and describe what it means in this situation.  $5 \leq t \leq 7$

c) Which of these intervals has the greatest rate of change?  $8 \leq t \leq 9$  or  $13 \leq t \leq 14$

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## ANSWERS

1. a) Absolute Max: None Absolute Min:  $(3.17, -7.27)$

Relative Min:  $(-1.06, -3.03)$  Relative Max:  $(0.89, 5.06)$

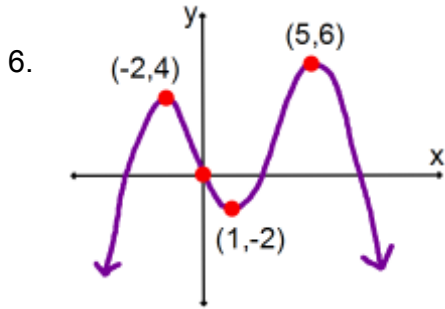
b) Increasing:  $(-1.06, 0.89) \cup (3.17, \infty)$  Decreasing:  $(-\infty, -1.06) \cup (0.89, 3.17)$

2. Odd. Graph is symmetrical about the origin.

3. Even:  $f(3) = 2$   $f(-3) = 2$  when you evaluate the function using opposite x-values you get the same y-value in return.

4. Neither:  $f(-x) = 6(-x)^4 + 2(-x) - 8 = 6x^4 - 2x - 8$  This is neither the same as the original  $f(x)$  nor is it the opposite of  $f(x)$ .

5. Answers are given. Work and justifications will vary depending on method used. a) Odd b) Even c) Neither d) Even



7. a) Avg rate of change = 61 This represents the balloon is rising at a rate of 61 feet per minute.

b) Avg rate of change = -35 This represents the balloon is descending at a rate of 35 feet per minute

c) The avg rate of change on the interval  $8 \leq t \leq 9$  is -47 ft/min and the avg rate of change on the interval  $13 \leq t \leq 14$  is 43 ft/min. Therefore, the avg rate of change on the interval  $8 \leq t \leq 9$  is greater. The fact it is negative just means that its in the opposite direction but is moving faster.