MCT 4C Test 4 Review: Polynomial Functions **Name: _____**

Multiple Choice: *Identify the choice that best completes the statement or answers the question.*

____ 1. Which of the following is a polynomial function?
a. $y = \sin(3x^2 - 2x)$
b. $y = 3x^2 - 2x$
c. $y = 3^x - 2x$
d. $y = 3x^2 - \sin 2x$

____ 2. The graph of the function $y = -3(x - 2)(x + 3)(x - 1)$ moves from
a. quadrant 2 to quadrant 1
b. quadrant 3 to quadrant 4
c. quadrant 3 to quadrant 1
d. quadrant 2 to quadrant 4

____ 3. Evaluate $f(x) = x^3 - x^2 + 4x + 4$ when $x = -2$.
a. –16
b. 0
c. 4
d. 12

____ 4. What is the polynomial function that best suits the table of values?

x	*y*
–2	3
–1	4
0	3
1	6
2	19

a. a cubic function
b. a linear function
c. a quadratic function
d. a quartic function

____ 5. The graph of a quartic function with four *x*-intercepts and a leading coefficient of –2 looks like
a. the letter m
b. the letter n
c. the letter u
d. the letter w

6. True/False Identify whether each statement is true or false. **Be sure to correct the statements that you feel are false.**

T F a) An even function must have at least one x-intercept.

T F b) The function $y = 4x^3 - 2x^2 + x + 5$ would have a maximum of 4 x-intercepts.

T F c) The end behaviour of $y = -2x^4 - x^2 - 6$ is Q3 to Q4.

T F d) A quartic function can resemble a quadratic function when graphed.

T F e) The end behaviour of the function $y = -0.5x^3 - 6x + 8$ is Q3 to Q1.

T F f) Even functions have line symmetry about the y-axis.

T F i) Only the range for a quartic function will be restricted, the domain will not.

T F j) The graph of the function $y = (x - 3)(x + 1)(x + 5)^2$ will have 4 x-intercepts.

7. Factor completely.

a) $p^2 - 10p - 24$ b) $x^4 - 81$ c) $8m^2 - 5m - 3$

d) $x^3 + 3x^2 - 4x - 12$

8. Determine algebraically whether the following functions are even, odd or neither.

a) $f(x) = -x^4 + 8x^2 - 16$ b) $f(x) = x^3 + 2x^2 - 3x + 4$

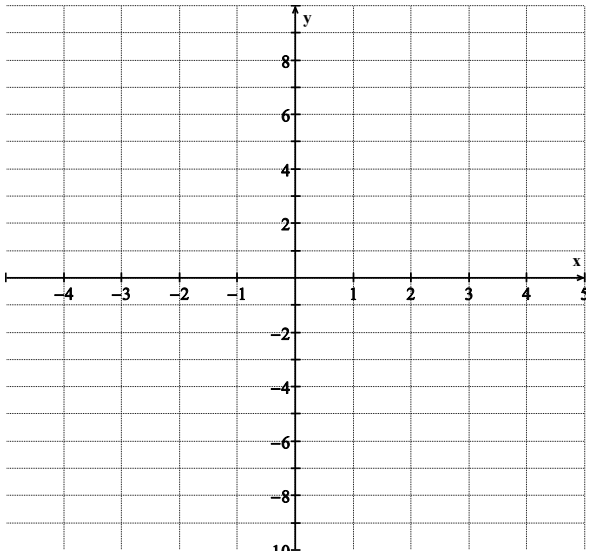
9. How can you tell by looking at the graph of a function whether the function is odd, even, or neither?

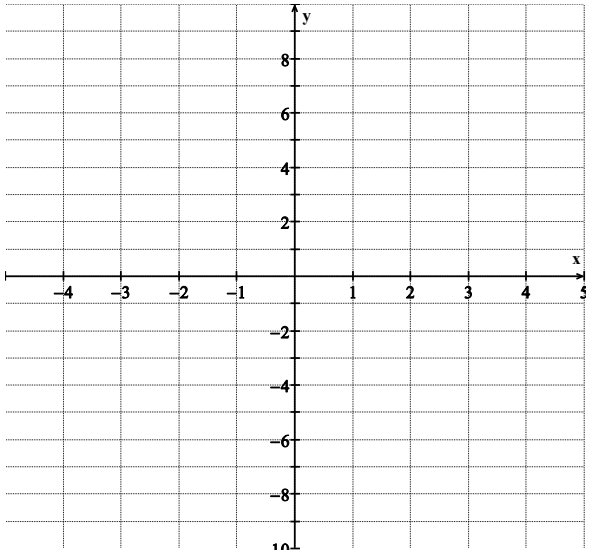
10. Consider each of the following polynomials.

a) Determine the following information for each:

Property	a) $y = (x-2)(x+1)(x+2)^2$	b) $y = -x^3 + 3x^2$
Degree of the polynomial		
Type of polynomial		
End behaviour		
Roots & order of each root		
y-intercept		

b) Sketch the graph of each polynomial from part a below.





11. A rock is thrown up into the air from the side of a cliff. Its height above the ground is given by the equation $h(t) = -4.9(t-5)(t+1)$, where *h* is the height of the rock, in metres, and *t* is the time, in seconds, after the rock is thrown.

a) How high is the rock when it is thrown?

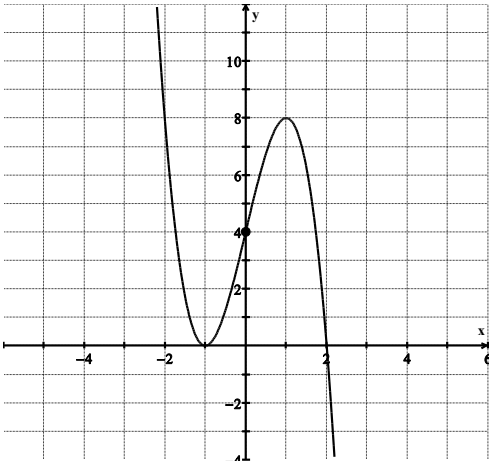
b) What is the height of the rock after 2 s?

c) How long does it take the rock to hit the ground?

d) What is the domain of this function in the context this question? Explain.

12. Determine an equation for each of the functions represented by the graphs below. Show your work.

a)



b)