

Math 3  
Unit 3 Test Review(1)

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Complete the table below

	Function	Degree	End Behavior	Domain and Range
A	$f(x) = 3x^5 - x^{10}$			
B	$g(x) = -x^2 + 5x + 3$			
C	$h(x) = 3(x + 2)(x - 4)$			
D	$j(x) = -2x^3 - x^2 + 5x - 1$			

2. Evaluate the polynomial  $f(x) = 3x^5 - x^3 + 6x^2 - x + 1$  for  $x = -2$ . Explain what your answer represents.

3. Find the zeros for the function  $f(x) = x^3 + 3x^2 - x - 3$

4. Show whether -4 is a zero of  $g(x) = x^3 - x^2 - 14x + 24$

5. Use the graph to answer the following questions

a) Increasing interval:

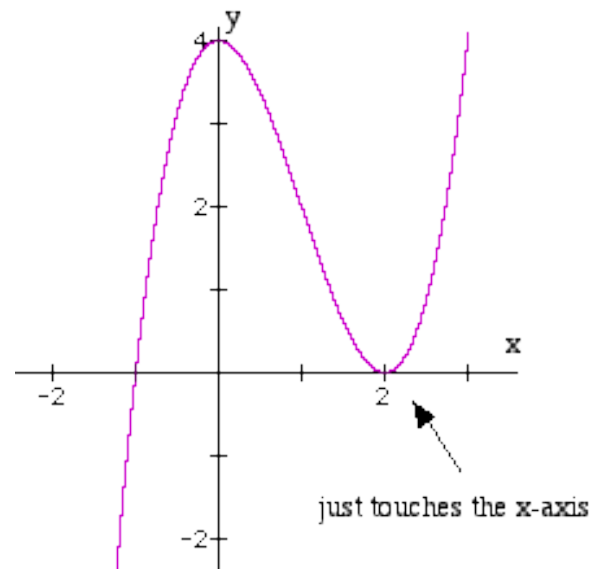
b) Decreasing interval:

c) Domain:

d) Range:

e) End Behavior:

f) Zeros:



Find all the zeros (Use Calc.)

6.  $f(x) = 2x^3 + 3x^2 - 39x - 20$  and 4 is a zero

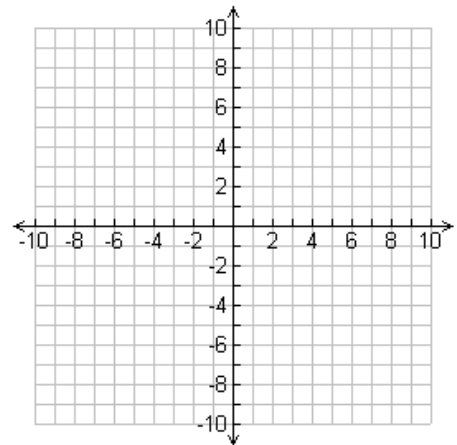
7.  $f(x) = x^4 - 5x^2 + 4$  and 1 is a zero

Divide using long division

8.  $x^3 - 3x^2 + 8x - 5 \div (x - 1)$

9.  $4x^3 - 12x^2 - x + 15 \div (2x - 3)$

10. Sketch a graph  $f(x) = -4(x - 1)^2(x - 3)(x + 8)$



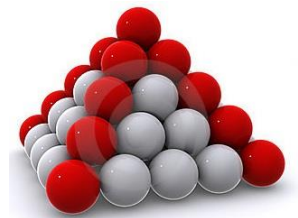
11. Write the function of  $x^4$  shifted 3 units down, 4 units left, a reflection over the x-axis and a horizontal compression by 3.

12. A cement walk of uniform width surrounds a rectangular swimming pool that is 10 m wide and 50 m long. Find the width of the walk if its area is  $864 \text{ m}^2$ .

13. The number of eggs,  $f(x)$ , in a female moth is a function of her abdominal width,  $x$ , in millimeters, modeled by  $f(x) = 14x^3 - 17x^2 - 16x + 34$ . What is the abdominal width when there are 211 eggs?

14. A pyramid can be formed using equal-size balls. For example, 3 balls can be arranged in a triangle, then a fourth ball placed in the middle on top of them.

The function  $p(n) = \frac{1}{6}n(n + 1)(n + 2)$  gives the number of balls in a pyramid, where  $n$  is the number of balls on each side of the bottom layer. (For the pyramid described above,  $n = 2$ . For the pyramid in the picture,  $n = 5$ .)



a. Evaluate  $p(2)$ ,  $p(3)$ , and  $p(4)$ .

b. If you had 1000 balls available and you wanted to make the largest possible pyramid using them, what would be the size of the bottom triangle, and how many balls would you use to make the pyramid? How many balls would be left over?