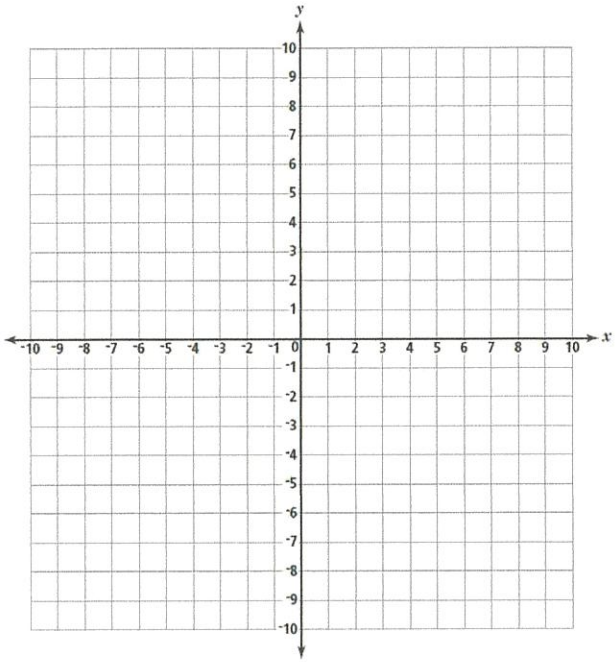
Name _____ Date _____

8A; Algebra 1 Period_____

Cubic Functions

I. 1) What is the parent equation for the Cubic Function?_____



2) Graph the parent function for the Cubic Function.

3) What is the Domain:_____

4) What is the Range:_____

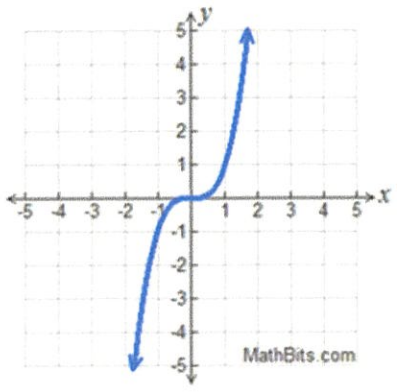
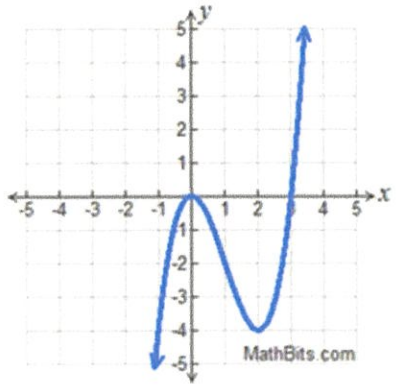
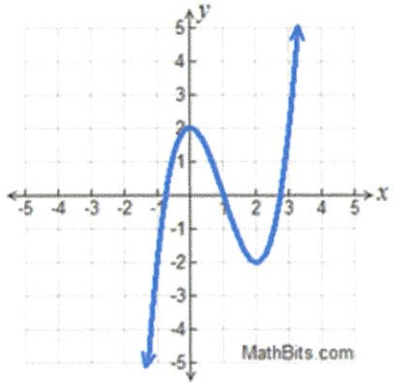
5) What is the Degree:_____

6) What is the root:_____

II. A cubic function is a polynomial function of degree 3 of the form $f(x) = ax^3 + bx^2 + cx + d$, where a, b, c, and d are real numbers and $a \neq 0$.

*A cubic function may have one, two or three x -intercepts, corresponding to the real roots of the related cubic equation (see below)

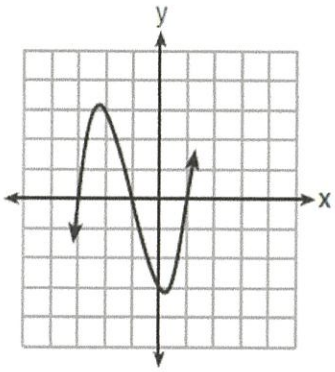
Cubic Function - Possible Real Roots:

		
$y = x^3$ 1 Real Root (repeated)	$y = x^3 - 3x^2$ 2 Real roots (1 repeated)	$y = x^3 - 3x^2 + 2$ 3 Real roots

III. Regents Examples with roots:

7)

A cubic function is graphed on the set of axes below.

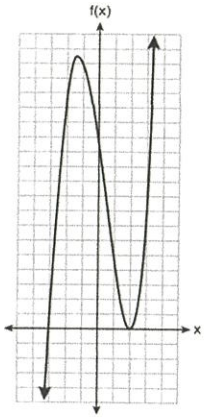


Which function could represent this graph?

1) $f(x) = (x-3)(x-1)(x+1)$
2) $g(x) = (x+3)(x+1)(x-1)$
3) $h(x) = (x-3)(x-1)(x+3)$
4) $k(x) = (x+3)(x+1)(x-3)$

8)

A function is graphed below.

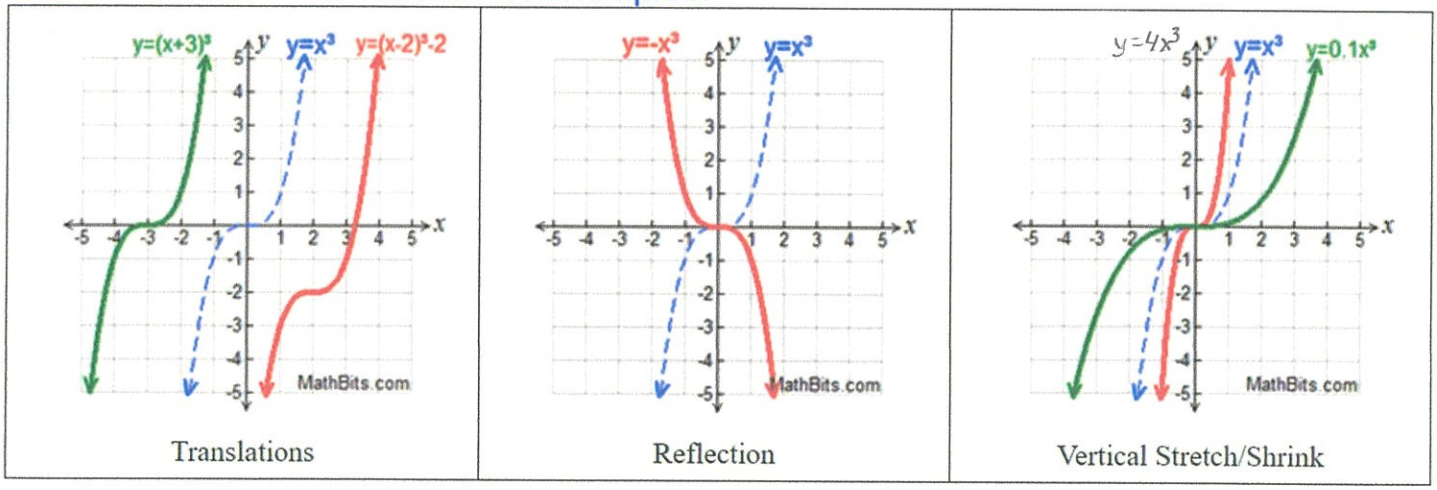


A possible equation for this function is

1) $f(x) = (x+2)(x-3)$
2) $f(x) = (x-2)(x+3)$
3) $f(x) = (x-2)^2(x+3)$
4) $f(x) = (x-2)(x+3)(x-12)$

IV. Transformations of Cubic Functions:

Cubic Function - Transformation Examples:



Translations | Reflection | Vertical Stretch/Shrink

#'s 9-11: How would each of the following graphs change in relation to the parent graph $y = x^3$?

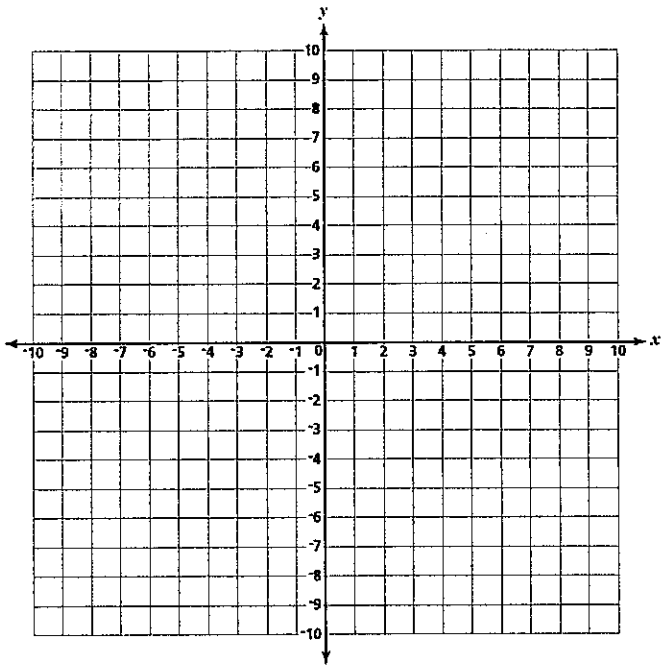
9) $y = (x - 3)^3$

10) $y = x^3 + 5$

11) $y = 3(x + 2)^3 - 7$

#'s 12-14: Graph the following cubic functions.

12) $y = -x^3$

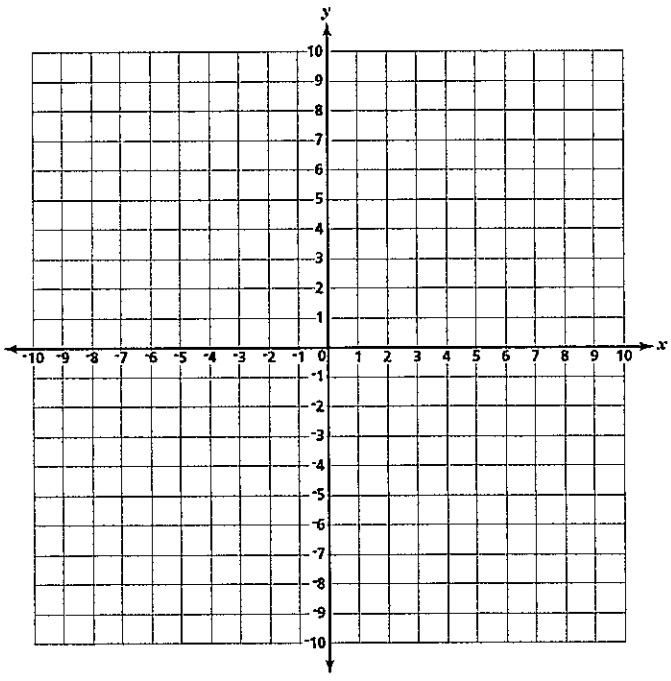


Domain:_____

Range:_____

Roots: _____

13) $y = -x^3 + 3x + 2$

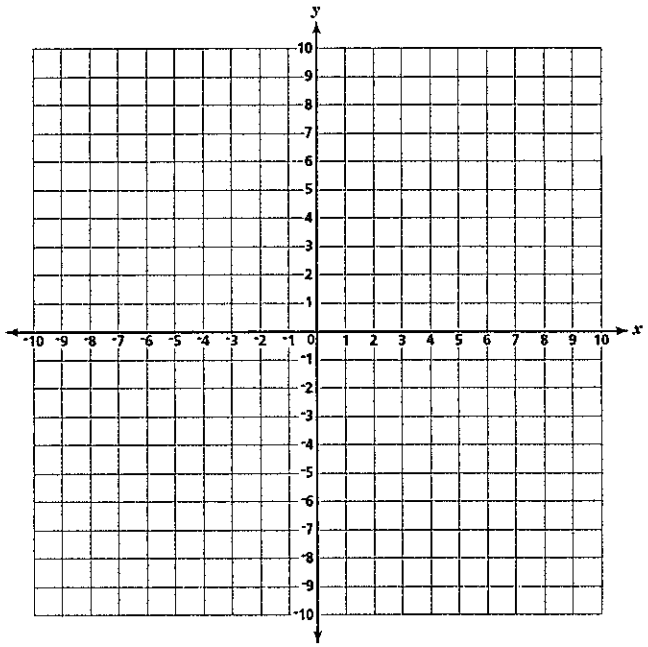


Domain:_____

Range:_____

Roots:_____

14) $y = x^3 - 3x^2 - x + 3$



Domain:_____

Range:_____

Roots:_____