

Module 1, Topic 2 DCA Review (A.APR.B)

1) Consider the function $f(x) = x^2 - 1$. Dilate $f(x)$ by $x + 3$ to create a new function of higher degree.

a) Write the dilation of $f(x)$ as $g(x)$. [Note: You may leave this one in factored form]

$$g(x) = (x^2 - 1)(x + 3)$$

$$x^2 - 1 = 0$$

$$x^2 = 1$$

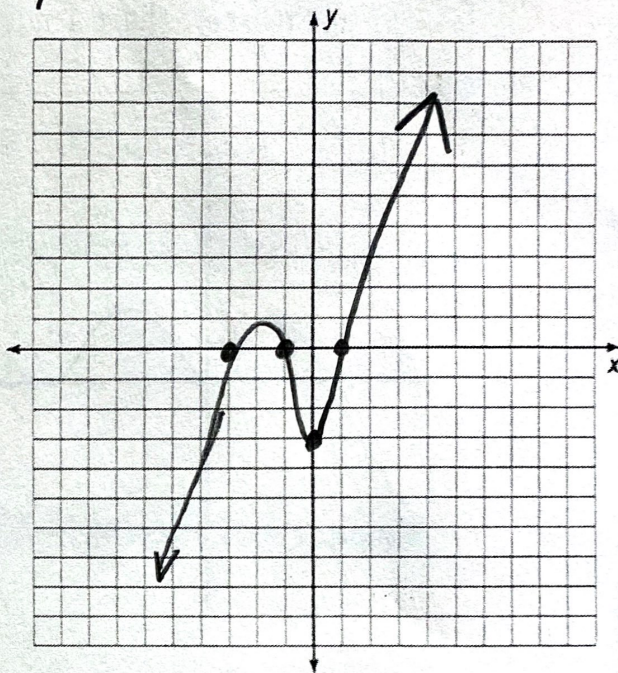
$$x = \pm\sqrt{1} \quad x = -1, x = 1, x = -3$$

c) Identify the zeros of the graph of the function of $g(x)$.

$$-1, 1, -3$$

b) Sketch the graph of $g(x)$.

$$y\text{-int} = (0^2 - 1)(0 + 3) = -3$$



2) Describe the end behavior of each function.

a) $r(x) = -5x^{10} + 2x^6 - 12x - 13$

Enters lower left,
exits lower right.

b) $h(x) = x^7 + 4x^5 - 9x^3 + 2$

Enters lower left,
exits upper right.

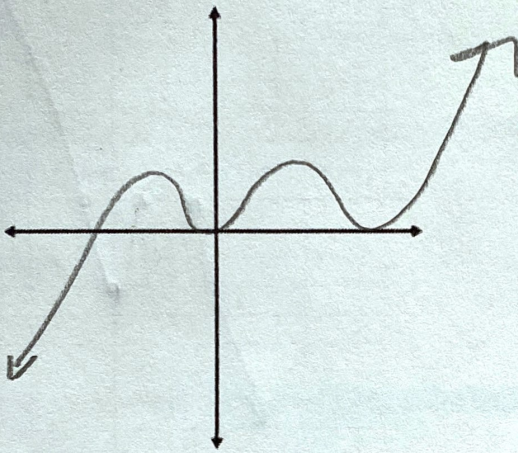
3) $f(x) = x^2$ has been transformed into $g(x) = -2(x + 4)^2 + 8$. Describe the transformations that map $f(x)$ onto $g(x)$.

- Reflected across the x-axis.
- Dilate by a factor of 2.
- Translate left 4 & up 8.

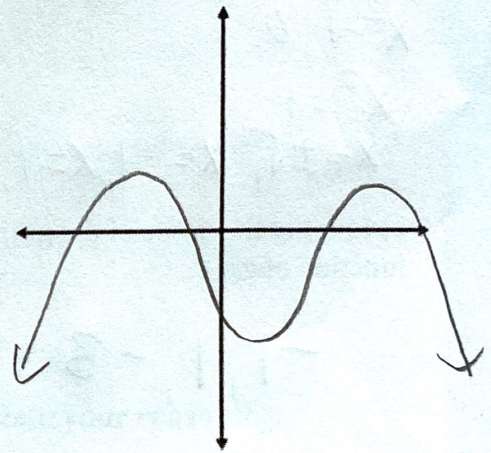
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4) Sketch the basic shape of each function.

- a)
- Polynomial with degree 5,
 - a is positive
 - one zero has a multiplicity of one, and two zeros have a multiplicity of two.



- b)
- Polynomial with degree 4,
 - a is negative,
 - each zero has a multiplicity of one.



Exemplary - If you are already Meeting on the rest of the assessment.

5)

a) Write a new function, $g(x)$, that is a product of the functions shown. [Note: You may not leave this one in factored form]. Show your work!

a) $y = -x$

b) $y = -2x - 6$

c) $y = 3x + 6$

$$-x(-2x-6)(3x+6)$$

$$+ (2x^2+6x)(3x+6)$$

$$= 6x^3 + 12x^2 + 18x^2 + 36x$$

$g(x) = 6x^3 + 30x^2 + 36x$

b) Sketch the graph of $g(x)$.

