Pre-Calculus: Sec. 1.3 The Difference Quotient

Ex1) $Given: f(x) = 2x^2 - x + 3$

Find the Difference Quotient (simplified) : $\dfrac{f(x+h) - f(x)}{h}; h \neq 0$
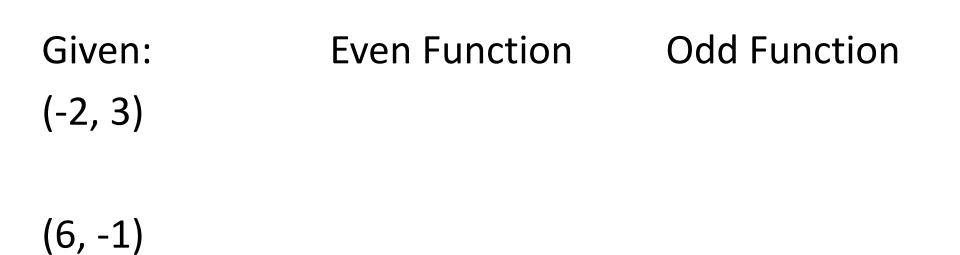
Ex2) $Given: f(x) = \sqrt{x}$

Find the Difference Quotient (simplified) : $\dfrac{f(4+h) - f(4)}{h}; h \neq 0$

Ex3) *Given*: $f(x) = x^3 - 8x$

Find the Difference Quotient (simplified): $\dfrac{f(x+h) - f(x)}{h}; h \neq 0$

Sec. 1.3 Even or Odd Functions
To Determine Even or Odd Functions…

- Always find *f(−x)* first!!! Then…

If *f(−x) = f(x):*	If *f(−x) = −f(x)*:
(Same as Original)	(Opposite of the Original)
Then the function is **Even**	Then the function is **Odd**
The graph of an Even function has y-axis symmetry.	The graph of an Odd function has origin symmetry.
(both *(−x, y)* and *(x, y)* are on the graph)	(both *(x, y)* and *(−x, −y)* are on the graph)

Find the coordinates of a 2ⁿᵈ point on the graph:

Given: Even Function   Odd Function

(-2, 3)

(6, -1)

(-5,-2)

Ex. 1: Algebraically determine whether each of the following functions are even, odd, or neither.

$$a)\ h(x) = \frac{-x}{\sqrt{7 + x^2}}$$

$$b) \ f(x) = \frac{x-1}{x-2x^2}$$

c) $g(x) = 2x\left|x^2 - 3\right|$

d) $f(x) = -2x^3 - x + 3$

e) $r(x) = \dfrac{3x^2 - 7}{|x| + 5}$

Review: Find the domain for the following functions.
Express your answers in *set* and *interval* notation.

$$a)f(x) = \sqrt{49 - x^2}$$

$$b)g(x) = \frac{2x}{\sqrt{x-3}}$$

$$c)h(x) = \frac{3x}{\sqrt{x^2 + 2}}$$

$$d)k(x) = 2 + \log_5(x-1)$$

$$e)f(x) = \frac{-7x}{\log_3(x-5)}$$