Topic: Even, odd, or neither

Question: Is the function even, odd, or neither?

$$f(x) = 2x^3 - x^7$$

Answer choices:

A Even

B Odd

C Neither

D The function can’t be classified

Solution: B

A function is even if $f(x) = f(-x)$, odd if $f(-x) = -f(x)$, and neither if $f(-x) \neq f(x)$ and $f(-x) \neq -f(x)$.

So to classify the given function, we'll substitute $-x$ into $f(x) = 2x^3 - x^7$ and then simplify the result.

$$f(-x) = 2(-x)^3 - (-x)^7$$

$$f(-x) = 2(-1x)^3 - (-1x)^7$$

$$f(-x) = 2(-1)^3(x^3) - (-1)^7(x^7)$$

$$f(-x) = 2(-1)x^3 - (-1)x^7$$

$$f(-x) = -2x^3 + x^7$$

$$f(-x) = -(2x^3 - x^7)$$

This function is odd, because $f(-x) = -f(x)$.

Topic: Even, odd, or neither

Question: Is the function even, odd, or neither?

$$f(x) = 5x^2 - 2x^3$$

Answer choices:

A Even

B Odd

C Neither

D The function can’t be classified

Solution: C

A function is even if $f(x) = f(-x)$, odd if $f(-x) = -f(x)$, and neither if $f(-x) \neq f(x)$ and $f(-x) \neq -f(x)$.

So to classify the given function, we'll substitute $-x$ into $f(x) = 5x^2 - 2x^3$ and then simplify the result.

$$f(-x) = 5(-x)^2 - 2(-x)^3$$

$$f(-x) = 5(-1x)^2 - 2(-1x)^3$$

$$f(-x) = 5(-1)^2(x^2) - 2(-1)^3(x^3)$$

$$f(-x) = 5(1)x^2 - 2(-1)x^3$$

$$f(-x) = 5x^2 + 2x^3$$

This function is neither even nor odd, because $f(-x) \neq f(x)$ and $f(-x) \neq -f(x)$.

Topic: Even, odd, or neither

Question: Is the function even, odd, or neither?

$$f(x) = -x^4 - 6x^2$$

Answer choices:

A Even

B Odd

C Neither

D The function can’t be classified

Solution: A

A function is even if $f(x) = f(-x)$, odd if $f(-x) = -f(x)$, and neither if $f(-x) \neq f(x)$ and $f(-x) \neq -f(x)$.

So to classify the given function, we'll substitute $-x$ into $f(x) = -x^4 - 6x^2$ and then simplify the result.

$$f(-x) = -(-x)^4 - 6(-x)^2$$

$$f(-x) = -(-1x)^4 - 6(-1x)^2$$

$$f(-x) = -(-1)^4(x^4) - 6(-1)^2(x^2)$$

$$f(-x) = -(1)x^4 - 6(1)x^2$$

$$f(-x) = -x^4 - 6x^2$$

This function is even, because $f(x) = f(-x)$.