Average Value of a Function

The average value of a function over the interval $[a, b]$ is

$$W = \lim_{n\to\infty} \frac{1}{b-a} \sum_{i=1}^{n} f(x_i^*)\Delta x \;=\; \frac{1}{b-a}\int_a^b f(x)dx$$

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Example: Find the average value of the function $f(x) = 2x$ on the interval $[-1, 3]$

$$A = \frac{1}{3-(-1)} \int_{-1}^{3} 2x dx = 2$$

Question 1

Find the average value of the function $f(x) = 1 - 2x$ on the interval $[0, 3]$

1. -3
2. -2
3. 2
4. -4
5. 5
6. none of the above

Question 1

Find the average value of the function $f(x) = 1 - 2x$ on the interval $[0, 3]$

1. -3
2. -2
3. 2
4. -4
5. 5
6. none of the above

2. -2 $\frac{1}{3-0} \int_1^3 (1 - 2x) x dx$

Question 2

Find the average value of the function $f(x) = x^2 + 2x - 5$ on the interval $[-2, 2]$

1. -3/5
2. -2/9
3. 2/11
4. -11/3
5. 5/3
6. none of the above

Question 2

Find the average value of the function $f(x) = x^2 + 2x - 5$ on the interval $[-2, 2]$

1. -3/5
2. -2/9
3. 2/11
4. -11/3
5. 5/3
6. none of the above

4. -11/3 $\frac{1}{2-(-2)} \int_{-2}^{2} (x^2 + 2x - 5) dx$

Question 3

Find the average value of the function $f(x) = x^3 - x$ on the interval $[1, 3]$

1. 5
2. 3
3. 2
4. 11
5. 8
6. none of the above

Question 3

Find the average value of the function $f(x) = x^3 - x$ on the interval $[1, 3]$

1. 5
2. 3
3. 2
4. 11
5. 8
6. none of the above

5. 8 $\frac{1}{3-1}\int_1^3 (x^3 - x)dx$

Question 4

Find the average value of the function $f(x) = x^4$ on the interval $[-1, 1]$

1. 1/5
2. 3/4
3. 2/7
4. 3/11
5. 3/8
6. none of the above

Question 4

Find the average value of the function $f(x) = x^4$ on the interval $[-1, 1]$

1. 1/5
2. 3/4
3. 2/7
4. 3/11
5. 3/8
6. none of the above

1. 1/5 $\frac{1}{1-(-1)} \int_{-1}^{1} x^4 dx$