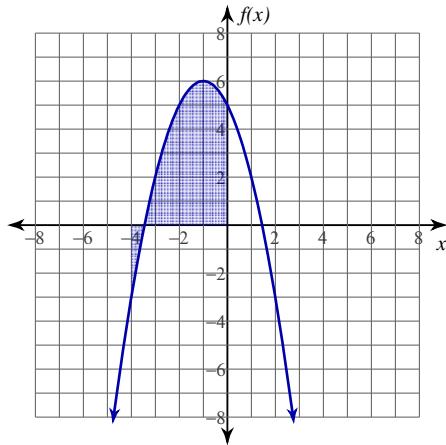


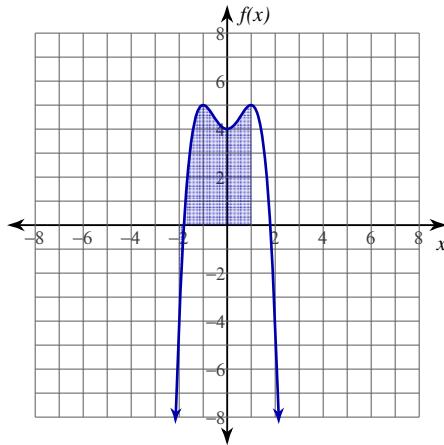
## Mean Value Theorem for Integrals

For each problem, find the average value of the function over the given interval.

1)  $f(x) = -x^2 - 2x + 5; [-4, 0]$

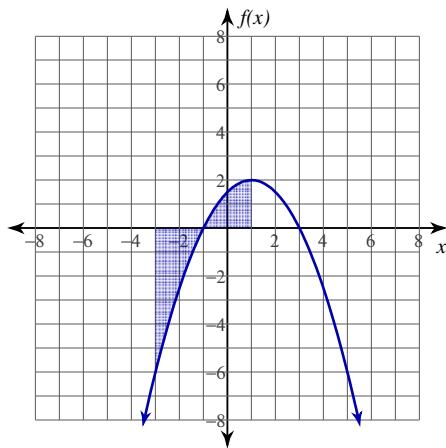


2)  $f(x) = -x^4 + 2x^2 + 4; [-2, 1]$

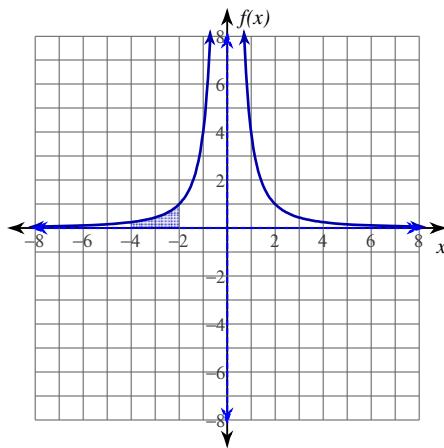


For each problem, find the values of  $c$  that satisfy the Mean Value Theorem for Integrals.

3)  $f(x) = -\frac{x^2}{2} + x + \frac{3}{2}; [-3, 1]$



4)  $f(x) = \frac{4}{x^2}; [-4, -2]$



**For each problem, find the average value of the function over the given interval.**

5)  $f(x) = -x^3 + 7x^2 - 11x + 3$ ;  $[1, 5]$

6)  $f(x) = -x^5 + 3x^3$ ;  $[0, 1]$

7)  $f(x) = 4x^{\frac{1}{2}}$ ;  $[0, 3]$

8)  $f(x) = x^5 - 2x^3 + x$ ;  $[-1, 0]$

9)  $f(x) = \frac{1}{x}$ ;  $[2, 3]$

10)  $f(x) = x^5 - 4x^3 + 2x - 1$ ;  $[-2, 2]$

11)  $f(x) = -x^5 + 4x^3 - 5x - 3$ ;  $[-2, 0]$

12)  $f(x) = x^5 - 2x^3 - 2$ ;  $[-1, 1]$

**For each problem, find the average value of the function over the given interval. Then, find the values of  $c$  that satisfy the Mean Value Theorem for Integrals.**

13)  $f(x) = -x + 2$ ;  $[-2, 2]$

14)  $f(x) = -x^2 - 8x - 17$ ;  $[-6, -3]$

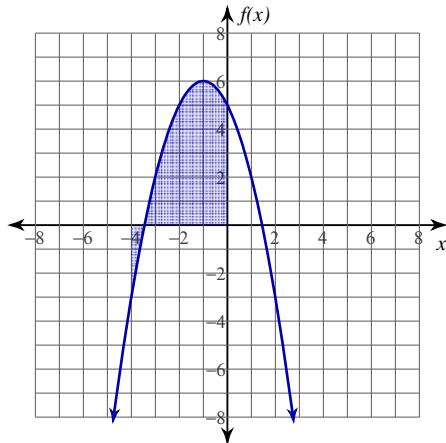
15)  $f(x) = -3(2x - 6)^{\frac{1}{2}}$ ;  $[3, 5]$

16)  $f(x) = \frac{4}{(2x + 6)^2}$ ;  $[-6, -5]$

## Mean Value Theorem for Integrals

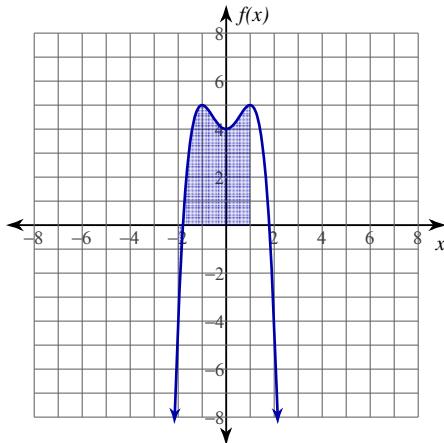
For each problem, find the average value of the function over the given interval.

1)  $f(x) = -x^2 - 2x + 5; [-4, 0]$



$$\frac{11}{3} \approx 3.667$$

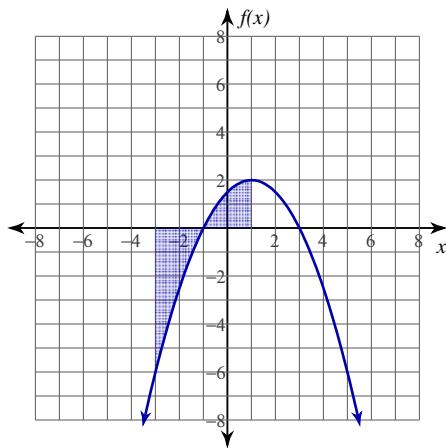
2)  $f(x) = -x^4 + 2x^2 + 4; [-2, 1]$



$$\frac{19}{5} = 3.8$$

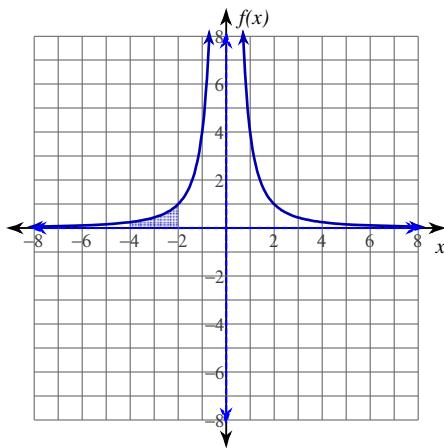
For each problem, find the values of  $c$  that satisfy the Mean Value Theorem for Integrals.

3)  $f(x) = -\frac{x^2}{2} + x + \frac{3}{2}; [-3, 1]$



$$\frac{3 - 4\sqrt{3}}{3} \approx -1.309$$

4)  $f(x) = \frac{4}{x^2}; [-4, -2]$



$$-2\sqrt{2} \approx -2.828$$

**For each problem, find the average value of the function over the given interval.**

5)  $f(x) = -x^3 + 7x^2 - 11x + 3$ ;  $[1, 5]$

$$\frac{10}{3} \approx 3.333$$

6)  $f(x) = -x^5 + 3x^3$ ;  $[0, 1]$

$$\frac{7}{12} \approx 0.583$$

7)  $f(x) = 4x^{\frac{1}{2}}$ ;  $[0, 3]$

$$\frac{8\sqrt{3}}{3} \approx 4.619$$

8)  $f(x) = x^5 - 2x^3 + x$ ;  $[-1, 0]$

$$-\frac{1}{6} \approx -0.167$$

9)  $f(x) = \frac{1}{x}$ ;  $[2, 3]$

$$\ln 3 - \ln 2 \approx 0.405$$

10)  $f(x) = x^5 - 4x^3 + 2x - 1$ ;  $[-2, 2]$

$$-1$$

11)  $f(x) = -x^5 + 4x^3 - 5x - 3$ ;  $[-2, 0]$

$$-\frac{2}{3} \approx -0.667$$

12)  $f(x) = x^5 - 2x^3 - 2$ ;  $[-1, 1]$

$$-2$$

**For each problem, find the average value of the function over the given interval. Then, find the values of  $c$  that satisfy the Mean Value Theorem for Integrals.**

13)  $f(x) = -x + 2$ ;  $[-2, 2]$

Average value of function: 2

Values that satisfy MVT: 0

14)  $f(x) = -x^2 - 8x - 17$ ;  $[-6, -3]$

Average value of function: -2

Values that satisfy MVT: -5, -3

15)  $f(x) = -3(2x - 6)^{\frac{1}{2}}$ ;  $[3, 5]$

Average value of function: -4

Values that satisfy MVT:  $\frac{35}{9} \approx 3.889$

16)  $f(x) = \frac{4}{(2x + 6)^2}$ ;  $[-6, -5]$

Average value of function:  $\frac{1}{6} \approx 0.167$

Values that satisfy MVT:  $-3 - \sqrt{6} \approx -5.449$