

Average Rate of Change

Find $(f(b) - f(a))/(b - a)$. Round only final nonterminating values to 4 decimals.

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

2. $f(x) = 1e^{(-1x+0)}$; $[1, 3]$

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

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

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

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

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Find $(f(b) - f(a))/(b - a)$. Round only final nonterminating values to 4 decimals.

7. $f(x) = 3x^2 - 6x + 1; [-2, 1]$

8. $f(x) = 2e^{(3x-2)+1}; [1, 3]$

9. $f(x) = 2e^{(-1x+0)}; [1, 3]$

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

11. $f(x) = (x^2 - 6x)/(2x^2 - 12x + 18); [5, 8]$

12. $f(x) = (1/2)/(x^2 - 4x + 4) + (-3)/(x^2); [4, 7]$

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Answer Key

Find $(f(b) - f(a))/(b - a)$. Round only final nonterminating values to 4 decimals.

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

$$f(5) = 26/3; f(8) = 65/6$$

$$(f(8) - f(5))/(3) = 13/18$$

$$\text{Answer: } 13/18 \approx 0.7222$$

2. $f(x) = 1e^{(-1x+0)}$; [1, 3]

$$f(1) = 1e^{(-1(1)+0)}; f(3) = 1e^{(-1(3)+0)}$$

$$(f(3) - f(1))/(2) = (1e^{(-1(3)+0)} - 1e^{(-1(1)+0)})/2$$

$$\text{Answer: } (1e^{(-1(3)+0)} - 1e^{(-1(1)+0)})/2 \approx -0.1590$$

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

$$f(-2) = 11; f(1) = 2$$

$$(f(1) - f(-2))/(3) = -3$$

$$\text{Answer: } -3$$

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

$$f(-2) = -1; f(1) = 2$$

$$(f(1) - f(-2))/(3) = 1$$

$$\text{Answer: } 1$$

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

$$f(-2) = 12; f(1) = 0$$

$$(f(1) - f(-2))/(3) = -4$$

Answer: -4

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

$$f(-2) = -21; f(1) = -3$$

$$(f(1) - f(-2))/(3) = 6$$

Answer: 6

7. $f(x) = 3x^2 - 6x + 1$; $[-2, 1]$

$$f(-2) = 25; f(1) = -2$$

$$(f(1) - f(-2))/(3) = -9$$

Answer: -9

8. $f(x) = 2e^{(3x-2)+1}$; $[1, 3]$

$$f(1) = 2e^{(3(1)-2)+1}; f(3) = 2e^{(3(3)-2)+1}$$

$$(f(3) - f(1))/(2) = (2e^{(3(3)-2)+1} - 2e^{(3(1)-2)+1})/2$$

Answer: $(2e^{(3(3)-2)+1} - 2e^{(3(1)-2)+1})/2 \approx 1093.9149$

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9. $f(x) = 2e^{(-1x+0)}$; $[1, 3]$
 $f(1) = 2e^{(-1(1)+0)}$; $f(3) = 2e^{(-1(3)+0)}$
 $(f(3) - f(1))/(2) = (2e^{(-1(3)+0)} - 2e^{(-1(1)+0)})/2$
Answer: $(2e^{(-1(3)+0)} - 2e^{(-1(1)+0)})/2 \approx -0.3181$

10. $f(x) = -x^3 + 2x^2 + x - 3$; $[-2, 1]$
 $f(-2) = 11$; $f(1) = -1$
 $(f(1) - f(-2))/(3) = -4$
Answer: -4

11. $f(x) = (x^2 - 6x)/(2x^2 - 12x + 18)$; $[5, 8]$
 $f(5) = -5/8$; $f(8) = 8/25$
 $(f(8) - f(5))/(3) = 63/200$
Answer: $63/200$

12. $f(x) = (1/2)/(x^2 - 4x + 4) + (-3)/(x^2)$; $[4, 7]$
 $f(4) = -1/16$; $f(7) = -101/2450$
 $(f(7) - f(4))/(3) = 139/19600$
Answer: $139/19600 \approx 0.0071$