

Free Calculus Exercises

MyMathYourMath.com

2021

Contents

1. Limits
2. Derivatives
3. Integrals

1. Limits

(a) Evaluate

$$\lim_{x \rightarrow 2} 8 - 3x + 12x^2$$

(b) Evaluate

$$\lim_{x \rightarrow -3} \frac{6 + 4x}{x^2 + 1}$$

(c) Evaluate

$$\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$$

(d) Evaluate

$$\lim_{x \rightarrow -5} \frac{x^2 - 25}{x^2 + 2x - 15}$$

Answers:

(a) 50 plug in

(b) $\frac{-3}{5}$ plug in

(c) $\frac{1}{4}$ hint: multiply but conjugate

(d) $\frac{5}{4}$ hint: factor and cancel

[<back2top>](#)

2. Derivatives

(a) Find the derivative

$$f(x) = x^2 - 3x + 10.$$

(b) Find the derivative

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

(c) Find the derivative

$$f(x) = \frac{1}{2}x^2 - 3x - 3$$

(d) Find the derivative

$$f(x) = \ln x$$

(e) Find the derivative

$$f(x) = \ln x^2$$

(f) Find the derivative

$$f(x) = \ln 2x$$

(g) Find the derivative

$$f(x) = e^x$$

(h) Find the derivative

$$f(x) = e^{x^2-2}$$

(i) Find the derivative

$$f(x) = \sqrt{x}$$

(j) Find the derivative

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

Answers:

(a) $f'(x) = 2x - 3$

(b) $f'(x) = 3x^2 - 2x + 1$

(c) $f'(x) = x - 3$

(d) $f'(x) = \frac{1}{x}$

(e) $f'(x) = \frac{2}{x}$

(f) $f'(x) = \frac{1}{x}$

(g) $f'(x) = e^x$

(h) $f'(x) = 2xe^{x^2-2}$

(i) $f'(x) = \frac{1}{2\sqrt{x}}$

(j) $f'(x) = \frac{x-1}{\sqrt{x^2-2x}}$

[<back2top>](#)

3. Integrals

(a) Evaluate the integral

$$\int x^2 dx.$$

(b) Evaluate the integral

$$\int \frac{3}{2}x^2 - x + 3 dx.$$

(c) Evaluate the integral

$$\int \frac{1}{x} dx.$$

(d) Evaluate the integral

$$\int \frac{2}{x} dx.$$

(e) Evaluate the integral

$$\int e^x dx.$$

(f) Evaluate the integral

$$\int e^{-x} dx.$$

(g) Evaluate the integral

$$\int \frac{1}{3x^{\frac{2}{3}}} dx$$

Answers:

(a) $\frac{1}{3}x^3 + C$

(b) $\frac{1}{2}x^3 - \frac{1}{2}x^2 + 3x + C$

(c) $\ln |x| + C$

(d) $\ln x^2 + C$

(e) $e^x + C$

(f) $-e^{-x} + C$

(g) $\sqrt[3]{x} + C$

[<back2top>](#)