



(5)

BARTOSZ MAZINOWSKI

2005342

06.05.2021



~~15~~

(6)

$$a) \int x^4 + 3x^2 - 3x + 1 \, dx$$

$$\int x^n dx = \frac{x^{n+1}}{n+1}$$

$$\int x^4 dx + \int 3x^2 dx - \int 3x dx + \int 1 dx$$

$$\frac{x^5}{5} + x^3 - \frac{3x^2}{2} + x$$

$$\frac{x^5}{5} + x^3 - \frac{3x^2}{2} + x + C$$

$$b) \int (x-1)(x-3) \, dx$$

$$\int x^2 - 3x - x + 3 \, dx$$

$$\int x^2 - 4x + 3 \, dx$$

$$\int x^2 dx - \int 4x dx + \int 3 dx$$

$$\frac{x^3}{3} - 2x^2 + 3x + C$$





6

BARTOSZ MALINOWSKI 2005342

06.05.2021



~~$$\int \sec^2(x) dx$$~~
~~$$\int \sec^2(x) dx$$~~

$$d) \int_0^4 (x+3)(x+2) dx$$

$$\int (x+3) \cdot (x+2) dx$$

$$\int x^2 + 2x + 3x + 6 dx$$

$$\int x^2 + 5x + 6 dx$$

$$\int x^2 dx + \int 5x dx + \int 6 dx$$

$$\left(\frac{x^3}{3} + \frac{5x^2}{2} + 6x \right) \Big|$$

$$\frac{4^3}{3} + \frac{5 \times 4^2}{2} + 6 \times 4 - \left(\frac{0^3}{3} + \frac{5 \times 0^2}{2} + 6 \times 0 \right) = \underline{\underline{\frac{256}{3}}}$$

$$e) \int_2^3 x(x+1) + e^x dx$$

$$\int x^2 + x + e^x dx$$

$$\int x^2 dx + \int x dx + \int e^x dx$$

$$\left(\frac{x^3}{3} + \frac{x^2}{2} + e^x \right) \Big|_2^3$$

$$\underline{\underline{\frac{53}{6} + e^3 - e^2}}$$

$$\frac{3^3}{3} + \frac{3^2}{2} + e^3 - \left(\frac{2^3}{3} + \frac{2^2}{2} + e^2 \right)$$



①

①

$$a) y = 7x^3 - 2x^2 + x + 2$$

$$y = \frac{d}{dx}(7x^3) + \frac{d}{dx}(-2x^2) + \frac{d}{dx}(x) + \frac{d}{dx}(2)$$

$$y = 7 \times 3x^2 - 2 \times 2x + 1 + 0$$

$$\underline{y = 21x^2 - 4x + 1}$$

$$\frac{d}{dx}(a \cdot f) = a \frac{d}{dx}(f)$$

b)

$$y = (x+3)(x+2)$$

$$y = \frac{d}{dx}((x+3) + (x+2))$$

$$y = \frac{d}{dx}(x^2 + 2x + 3x + 6)$$

$$y = \frac{d}{dx}(x^2 + 5x + 6)$$

$$y = \frac{d}{dx}(x^2) + \frac{d}{dx}(5x) + \frac{d}{dx}(6)$$

$$\underline{y = 2x + 5}$$

$$\frac{d}{dx}(f+g) = \frac{d}{dx}(f) + \frac{d}{dx}(g)$$

$$\frac{d}{dx}(ax) = a$$

c)

$$y = \frac{1}{x^3} + \sin 3x$$

$$y = \frac{d}{dx}\left(\frac{1}{x^3} + \sin 3x\right)$$



(2)

BARTOSZ MALINOWSKI 2005342

06.06.2021

$$\frac{d}{dx} \left(\frac{1}{x^3} \right) = \frac{d}{dx} (x^{-3}) = -3x^{-4} = -\frac{3}{x^4}$$

$$y = \frac{d}{dx} \left(\frac{1}{x^3} \right) + \frac{d}{dx} (\sin^3 x)$$

$$y = -\frac{3}{x^4} + \cos(3x) \times 3$$

$$y = -\frac{3}{x^4} + 3\cos(3x)$$

d)

$$y = x^4 \tan 2x$$

$$y = \frac{d}{dx} (x^4 \times \tan(2x))$$

$$y = \frac{d}{dx} (x^4) \times \tan 2x + x^4 \times \frac{d}{dx} (\tan 2x)$$

$$y = 4x^3 \times \tan 2x$$

e)

$$y = (5x^2 + 2x + 1)^5$$

$$y = \frac{d}{dx} ((5x^2 + 2x + 1)^5)$$

$$y = \frac{d}{dg} (g^5) \times \frac{d}{dx} (5x^2 + 2x + 1)$$

$$y = 5g^4 \times (5x + 2)$$

$$\frac{d}{dx} (f(g)) = \frac{d}{dg} (f(g)) \times \frac{d}{dx} (g)$$

$$g = 5x^2 + 2x + 1$$

$$y = 5(5x^2 + 2x + 1)^4 \times (5x + 2)$$

$$y = 5(5x^2 + 2x + 1)^4 \times (10x + 2)$$

$$y = (50x + 10) \times (5x^2 + 2x + 1)^4$$

3

BARTOSZ MAJNOUSKI

2005342

06.05.2021

2

a)

$$\sin x = 0,65$$

$$x = \sin^{-1}(0,65)$$

$$\underline{x = 40,54^\circ}$$

$$x = 180^\circ - 40,54$$

$$\underline{x = 139,46^\circ}$$

b)

$$7 \cos x = 4$$

$$\cos x = \frac{4}{7} \approx 0,57$$

$$x = \cos^{-1}(0,57)$$

$$\underline{x = 55,24}$$

$$x = 360^\circ - 55,24$$

$$\underline{x = 304,76}$$

c) $\tan x = -0,22$

$$x = \tan^{-1}(-0,22)$$

$$\underline{\underline{x = -12,40}}$$

4

BARTOSZ MALINOWSKI

2005342

06.05.2021

3

~~scribbled out~~

$$(20^\circ) = (18^\circ) + (16^\circ) - 2(18)(16) \cos A$$

$$400 = 324 + 256 - 576 \cos A$$

$$-180 = -576 \cos A$$

$$\frac{-180}{-576} = \cos A$$

$$\frac{5}{16} = \cos A$$

5

a)

$$5^{x+2} = 2^x$$

$$\log_5(5^{x+2}) = \log_5(2^x)$$

$$x+2 = x \cdot \log_5(2)$$

$$x+2 = \log_5(2) x$$

$$x = \log_5(2) x - 2$$

$$\log_a(a^x) = x$$

$$x - \log_5(2) x = -2$$

$$(1 - \log_5(2)) x = -2 \quad | : 1 - \log_5(2)$$

$$x = \frac{-2}{1 - \log_5(2)}$$

$$x \approx -3,51$$

~~scribbled out~~