## ANALIZA MATEMATYCZNA

## LISTA ZADAŃ 11

## 18.12.17

(1) Oblicz całkę nieoznaczoną  $\int f(x) dx$  gdzie f jest dana wzorem:

(a) 
$$\frac{5x^2 - 12}{(x^2 - 6x + 13)^2},$$
(d) 
$$\frac{1}{1 + \sqrt{x+1}},$$

(b)  $\arctan(x)$ ,

(c) 
$$\arctan \sqrt{x}$$
,

$$(d) \quad \frac{1}{1+\sqrt{x+1}},$$

$$(f) \quad \frac{x}{(x+1)(2x+1)}$$

(g) 
$$\frac{x}{x^2 - 7x + 10}$$
,

(h) 
$$\frac{x-2}{x^2-7x+12}$$
,

(i) 
$$\frac{x}{2x^2 - 3x - 2}$$

(j) 
$$\frac{4x+3}{(x-2)^3}$$
,

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

(l) 
$$\frac{x^4}{x^2+1}$$
,

(m) 
$$\frac{1}{(x^2+9)^3}$$

(n) 
$$\frac{x^3 + x - 1}{(x^2 + 2)^2}$$
,

(o) 
$$\frac{\sqrt{x}}{\sqrt{x} - \sqrt[3]{x}},$$

$$(p) \quad \frac{1}{x\sqrt{x+1}},$$

(q) 
$$\frac{1}{1+\sqrt[3]{x+1}}$$
,

(r) 
$$\frac{e^x - 1}{e^x + 1}$$
  $(t = e^x)$ 

(s) 
$$\log(1+x^2)$$
,

$$(t) \quad \frac{x^2}{1+x^3},$$

(u) 
$$x \cdot \log(x^2 + 1)$$

(v) 
$$\frac{1}{x^2 - x - 1}$$
,

(w) 
$$\frac{7x^6 + 3x^2 + 4x}{x^7 + x^3 + 2x^2 + 4},$$

$$(x) \quad \sqrt{x \cdot \log(x)}$$

$$(y) \quad \frac{e^x}{e^{2x} + 1},$$

(z) 
$$e^{2x} + 1$$
,  $\sqrt{x+1} + 1$ 

(aa) 
$$\frac{e^x}{e^{3x} - 1}$$
,

(ab) 
$$\frac{1}{(x+1)\sqrt{x}},$$

(ac) 
$$\frac{\sqrt{x+1}+1}{\sqrt{x+1}-1}$$
,

(ad) 
$$\frac{1}{x^6 + x^4}$$
,

(a) 
$$\frac{1}{(x^2-6x+13)^2}$$
, (b)  $\arctan(x)$ , (c)  $\arctan(\sqrt{x})$ , (d)  $\frac{1}{1+\sqrt{x+1}}$ , (e)  $x^2 \log(x+1)$ , (f)  $\frac{x}{(x+1)(2x+1)}$ , (g)  $\frac{x}{x^2-7x+10}$ , (h)  $\frac{x-2}{x^2-7x+12}$ , (i)  $\frac{x}{2x^2-3x-2}$ , (j)  $\frac{4x+3}{(x-2)^3}$ , (k)  $\frac{x^3+1}{x^3-x^2}$ , (l)  $\frac{x^4}{x^2+1}$ , (m)  $\frac{1}{(x^2+9)^3}$ , (n)  $\frac{x^3+x-1}{(x^2+2)^2}$ , (o)  $\frac{\sqrt{x}}{\sqrt{x}-\sqrt[3]{x}}$ , (p)  $\frac{1}{x\sqrt{x+1}}$ , (q)  $\frac{1}{1+\sqrt[3]{x+1}}$ , (r)  $\frac{e^x-1}{e^x+1}$   $(t=e^x)$ , (s)  $\log(1+x^2)$ , (t)  $\frac{x^2}{1+x^3}$ , (u)  $x \cdot \log(x^2+1)$ , (v)  $\frac{1}{x^2-x-1}$ , (w)  $\frac{7x^6+3x^2+4x}{x^7+x^3+2x^2+4}$ , (x)  $\sqrt{x} \cdot \log(x)$ , (y)  $\frac{e^x}{e^{2x}+1}$ , (2)  $\frac{e^{2x}}{e^{2x}+1}$ , (aa)  $\frac{e^x}{e^{3x}-1}$ , (ab)  $\frac{1}{(x+1)\sqrt{x}}$ , (ac)  $\frac{\sqrt{x+1}+1}{\sqrt{x+1}-1}$ , (ad)  $\frac{1}{x^6+x^4}$ , (ae)  $\frac{1}{(x^2+2x+2)(x^2-4)}$ , (af)  $\frac{1}{\sqrt{1+\sqrt[3]{x+2}}}$ , (ag)  $\frac{x^4}{x^{15}-1}$ , (ah)  $\frac{1}{\sqrt{1+\sqrt[3]{x+2}}}$ , (ai)  $\frac{2x^2+41x-9}{x^2+41x-9}$ 

(ag) 
$$\frac{x^4}{x^{15}-1}$$
,

(ah) 
$$\frac{1}{x^4 + 1}$$
,

(ai) 
$$x^2 \arctan(x)$$
,

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(ai) 
$$x^2 \arctan(x)$$
, (aj)  $\frac{2x^2 + 41x - 91}{(x-1)(x+3)(x-4)}$ .

(2) Wyraź  $I_n$  przy pomocy  $I_{n-1}$  lub  $I_{n-2}$ 

(a) 
$$I_n(x) = \int \frac{1}{(x^2 + 4)^n} dx$$
, (b)  $I_n(x) = \int x^n e^x dx$ ,

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(c) 
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,

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, (d)  $I_n(x) = \int x^n \sin(x) dx$ ,

(e) 
$$I_n(x) = \int \log^n(x) dx$$
, (f)  $I_n(x) = \int x^n e^{x^2} dx$ .

(f) 
$$I_n(x) = \int x^n e^{x^2} dx$$