2022Call4.

(1) **Q1**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly 0 or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Complete the formulae.

$$\log(x) = \boxed{a} + \boxed{b}(x-1) + \frac{\boxed{c}}{\boxed{d}}(x-1)^2 + \frac{\boxed{e}}{\boxed{f}}(x-1)^3 + o((x-1)^3) \text{ as } x \to 1.$$

$\boxed{a}$:

NUMERICAL | 1 point

0 ✓	

$\boxed{b}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{c}$:

NUMERICAL | 1 point

-1 ✓	

$\boxed{d}$:

NUMERICAL | 1 point

2 ✓	

$\boxed{e}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{f}$:

NUMERICAL | 1 point

3 ✓	

$$(x-1)x^{\frac{1}{3}} = \boxed{g} + \boxed{h}(x-1) + \frac{\boxed{i}}{\boxed{j}}(x-1)^2 + \frac{\boxed{k}}{\boxed{l}}(x-1)^3 + o((x-1)^3) \text{ as } x \to 1.$$

$\boxed{g}$:

NUMERICAL | 1 point

0 ✓	

h:

NUMERICAL 1 point

1 ✓	

i:

NUMERICAL 1 point

1 ✓	

j:

NUMERICAL 1 point

3 ✓	

k:

NUMERICAL 1 point

-1 ✓	

l:

NUMERICAL 1 point

9 ✓	

$(x-1)^2 \sin(x-1) = \boxed{\text{m}} + \boxed{\text{n}}(x-1) + \boxed{\text{o}}(x-1)^2 + \boxed{\text{p}}(x-1)^3 + o((x-1)^3)$ as $x \to 1$.

m:

NUMERICAL 1 point

0 ✓	

n:

NUMERICAL 1 point

0 ✓	

o:

NUMERICAL 1 point

0 ✓	

p:

NUMERICAL 3 points

1 ✓	

For various $\alpha, \beta \in \mathbb{R}$, study the limit:

$$\lim_{x \to 1} \frac{\log(x) + (x-1)x^{\frac{1}{3}} + \alpha(x-1) + \beta(x-1)^2}{(x-1)^2 \sin(x-1)}.$$

This limit converges for $\alpha = \boxed{\text{q}}$, $\beta = \frac{\boxed{\text{r}}}{\boxed{\text{s}}}$.

q:

NUMERICAL | 6 points

-2 ✓	

r:

NUMERICAL | 3 points

1 ✓	

s:

NUMERICAL | 3 points

6 ✓	

In that case, the limit is $\frac{\boxed{t}}{\boxed{u}}$.

t:

NUMERICAL | 3 points

2 ✓	

u:

NUMERICAL | 3 points

9 ✓	

(2) **Q1**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly** 0 **or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Complete the formulae.

$$\log(x) = \boxed{a} + \boxed{b}(x-1) + \frac{\boxed{c}}{\boxed{d}}(x-1)^2 + \frac{\boxed{e}}{\boxed{f}}(x-1)^3 + o((x-1)^3) \text{ as } x \to 1.$$

a:

NUMERICAL | 1 point

0 ✓	

b:

NUMERICAL | 1 point

1 ✓	

c:

NUMERICAL | 1 point

-1 ✓	

d:

NUMERICAL 1 point

2 ✓	

e:

NUMERICAL 1 point

1 ✓	

f:

NUMERICAL 1 point

3 ✓	

$$(1-x)x^{\frac{1}{3}} = \boxed{\text{g}} + \boxed{\text{h}}(x-1) + \frac{\boxed{\text{i}}}{\boxed{\text{j}}}(x-1)^2 + \frac{\boxed{\text{k}}}{\boxed{\text{l}}}(x-1)^3 + o((x-1)^3) \text{ as } x \to 1.$$

g:

NUMERICAL 1 point

0 ✓	

h:

NUMERICAL 1 point

-1 ✓	

i:

NUMERICAL 1 point

-1 ✓	

j:

NUMERICAL 1 point

3 ✓	

k:

NUMERICAL 1 point

1 ✓	

l:

NUMERICAL 1 point

9 ✓	

$$(x-1)^2 \sin(3(x-1)) = \boxed{\text{m}} + \boxed{\text{n}}(x-1) + \boxed{\text{o}}(x-1)^2 + \boxed{\text{p}}(x-1)^3 + o((x-1)^3) \text{ as } x \to 1.$$

m:

NUMERICAL 1 point

0 ✓	

n:

NUMERICAL 1 point

0 ✓	

o:

NUMERICAL 1 point

0 ✓	

p:

NUMERICAL 3 points

3 ✓	

For various $\alpha, \beta \in \mathbb{R}$, study the limit:

$$\lim_{x\to 1} \frac{\log(x) + (1-x)x^{\frac{1}{3}} + \alpha(x-1) + \beta(x-1)^2}{(x-1)^2 \sin(3(x-1))}.$$

This limit converges for $\alpha = \boxed{q}, \beta = \frac{\boxed{r}}{\boxed{s}}$.

q:

NUMERICAL 6 points

0 ✓	

r:

NUMERICAL 3 points

5 ✓	

s:

NUMERICAL 3 points

6 ✓	

In that case, the limit is $\frac{\boxed{t}}{\boxed{u}}$.

t:

NUMERICAL 3 points

4 ✓	

u:

NUMERICAL 3 points

27 ✓	

(3) **Q2**

CLOZE 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly 0 or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us study the following series $\sum_{n=0}^{\infty} \frac{4^n-1}{n^2+2}(x+1)^{2n}$, with various x.

This series makes sense also for $x \in \mathbb{C}$. For $x = i$, calculate the partial sum $\sum_{n=0}^{2} \frac{4^n-1}{n^2+2}(x+1)^{2n} = \boxed{a} + \boxed{b}i$.

$\boxed{a}$:

NUMERICAL | 1 point

-10 ✓	

$\boxed{b}$:

NUMERICAL | 1 point

2 ✓	

In order to discuss the convergence using the root test for $x \in \mathbb{R}$, we put $a_n = \frac{4^n-1}{n^2+2}|x+1|^{2n}$. Complete the formula.

$$\lim_{n\to\infty} (a_n)^{\frac{1}{n}} = \boxed{c}|x + \boxed{d}|^{\boxed{e}}.$$

$\boxed{c}$:

NUMERICAL | 2 points

4 ✓	

$\boxed{d}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{e}$:

NUMERICAL | 1 point

2 ✓	

Therefore, by the root test, the series converges absolutely for

MULTI | 2 points | Single

- all x.
- $-3 < x < -1$.
- $-3 < x < 1$.
- $-\frac{5}{3} < x < -\frac{1}{3}$.
- $-\frac{3}{2} < x < -\frac{1}{2}$. ✓
- $\frac{1}{3} < x < \frac{5}{3}$.
- $\frac{1}{2} < x < \frac{3}{2}$.
- $-1 < x < 1$.

- $-1 < x < 3$.
- $x = 0$.
- $1 < x < 3$.

For the case $x = -\frac{3}{2}$, the series

MULTI | 2 points | Single

- converges absolutely. ✓
- converges but not absolutely.
- diverges.

For the case $x = 1$, the series

MULTI | 2 points | Single

- converges absolutely.
- converges but not absolutely.
- diverges. ✓

(4) **Q2**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly 0 or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us study the following series $\sum_{n=0}^{\infty} \frac{4^n-1}{n^2+2}(x-1)^{2n}$, with various x.

This series makes sense also for $x \in \mathbb{C}$. For $x = i$, calculate the partial sum $\sum_{n=0}^{2} \frac{4^n-1}{n^2+2}(x-1)^{2n} = \boxed{a} + \boxed{b}i$.

$\boxed{a}$:

NUMERICAL | 1 point

-10 ✓	

$\boxed{b}$:

NUMERICAL | 1 point

-2 ✓	

In order to discuss the convergence using the root test for $x \in \mathbb{R}$, we put $a_n = \frac{4^n-1}{n^2+2}|x-1|^{2n}$. Complete the formula.

$$\lim_{n\to\infty} (a_n)^{\frac{1}{n}} = \boxed{c}|x + \boxed{d}|^{\boxed{e}}.$$

$\boxed{c}$:

NUMERICAL | 2 points

4 ✓	

d:

NUMERICAL | 1 point

-1 ✓	

e:

NUMERICAL | 1 point

2 ✓	

Therefore, by the root test, the series converges absolutely for

MULTI | 2 points | Single

- all x.
- $-3 < x < -1$.
- $-3 < x < 1$.
- $-\frac{5}{3} < x < -\frac{1}{3}$.
- $-\frac{3}{2} < x < -\frac{1}{2}$.
- $\frac{1}{3} < x < \frac{5}{3}$.
- $\frac{1}{2} < x < \frac{3}{2}$. ✓
- $-1 < x < 1$.
- $-1 < x < 3$.
- $x = 0$.
- $1 < x < 3$.

For the case $x = -\frac{3}{2}$, the series

MULTI | 2 points | Single

- converges absolutely.
- converges but not absolutely.
- diverges. ✓

For the case $x = 1$, the series

MULTI | 2 points | Single

- converges absolutely. ✓
- converges but not absolutely.
- diverges.

(5) **Q3**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly 0 or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us consider the following function

$$f(x) = \log\left(\frac{x}{1+\log(x)}\right).$$

The function $f(x)$ is not defined on the whole real line $\mathbb{R}$. Choose all the points that are **not** in the natural domain of $f(x)$.

MULTI 4 points Single

- $-e$ ✓
- -1 ✓
- $-\frac{1}{e}$ ✓
- 0 ✓
- $\frac{1}{e}$ ✓
- 1 (−100%)
- e (−100%)

Choose all asymptotes of $f(x)$.

MULTI 4 points Single

- $y = -\pi$ (−100%)
- $y = -\frac{\pi}{2}$ (−100%)
- $y = -\frac{\pi}{4}$ (−100%)
- $y = 0$ (−100%)
- $y = \frac{\pi}{4}$ (−100%)
- $y = \frac{\pi}{2}$ (−100%)
- $y = \pi$ (−100%)
- $x = -1$ (−100%)
- $x = 0$ (−100%)
- $x = 1/e$ ✓
- $x = 1$ (−100%)
- $x = e$ (−100%)
- $y = x$
  (−100%)
- $y = -x$ (−100%)
- $y = \pi x$ (−100%)

One has

$$f'(e) = \frac{\boxed{\text{a}}}{\boxed{\text{b}}\,e}.$$

a:

NUMERICAL 4 points

1 ✓	

b:

NUMERICAL 4 points

2 ✓	

The function $f(x)$ has [c] stationary point(s) in the domain [c]:

NUMERICAL | 4 points

1 ✓	

Choose the behaviour of $f(x)$ in the interval $(\frac{1}{2}, 2)$.

MULTI | 4 points | Single

- monotonically decreasing
- monotonically increasing
- neither decreasing nor increasing ✓

(6) **Q3**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly 0 or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us consider the following function

$$f(x) = \log\left(\frac{x}{2+\log(x)}\right).$$

The function $f(x)$ is not defined on the whole real line $\mathbb{R}$. Choose all the points that are **not** in the natural domain of $f(x)$.

MULTI | 4 points | Single

- $-e$ ✓
- -1 ✓
- $-1/e$ ✓
- $-1/e^2$ ✓
- 0 ✓
- $1/e^2$ ✓
- $1/e$ ✓
- 1 (−100%)
- e (−100%)

Choose all asymptotes of $f(x)$.

MULTI | 4 points | Single

- $y = -\pi$ (−100%)
- $y = -\frac{\pi}{2}$ (−100%)
- $y = -\frac{\pi}{4}$ (−100%)

- $y = 0$ (−100%)
- $y = \frac{\pi}{4}$ (−100%)
- $y = \frac{\pi}{2}$ (−100%)
- $y = \pi$ (−100%)
- $x = -1$ (−100%)
- $x = 0$ (−100%)
- $x = 1/e^2$ ✓
- $x = 1/e$ (−100%)
- $x = 1$ (−100%)
- $x = e$ (−100%)
- $x = e^2$ (−100%)
- $y = x$
  (−100%)
- $y = -x$ (−100%)
- $y = \pi x$ (−100%)

One has

$$f'(e) = \frac{\boxed{a}}{\boxed{b}e}.$$

$\boxed{a}$:

NUMERICAL | 4 points

2 ✓	

$\boxed{b}$:

NUMERICAL | 4 points

3 ✓	

The function $f(x)$ has $\boxed{c}$ stationary point(s) in the domain

$\boxed{c}$:

NUMERICAL | 4 points

1 ✓	

Choose the behaviour of $f(x)$ in the interval $(2, 3)$.

MULTI | 4 points | Single

- monotonically decreasing
- monotonically increasing ✓
- neither decreasing nor increasing

(7) **Q4**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly** 0 **or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us calculate the following integral.

$$\int_0^1 x^2 \exp(-x)dx.$$

It is easy to find a primitive of $\exp(-x)$. By integration by parts, one has

$$\int_0^1 x^2 \exp(-x) = \Big[\boxed{\text{a}}\Big]_0^1 - \int_0^1 \boxed{\text{b}}dx.$$

Choose the function $\boxed{\text{a}}$,

MULTI | 2 points | Single

- $\exp(-x)$
- $2x\exp(-x)$
- $x^2\exp(-x)$
- $-\exp(-x)$
- $-2x\exp(-x)$
- $-x^2\exp(-x)$ ✓

and $\boxed{\text{b}}$.

MULTI | 2 points | Single

- $\exp(-x)$
- $2x\exp(-x)$
- $x^2\exp(-x)$
- $-\exp(-x)$
- $-2x\exp(-x)$ ✓
- $-x^2\exp(-x)$

Continuing, one has $\int_0^1 x^2\exp(-x) = \boxed{\text{c}} + \boxed{\text{d}}e^{-1}$.

$\boxed{\text{c}}$:

NUMERICAL | 2 points

2 ✓	

$\boxed{\text{d}}$:

NUMERICAL | 2 points

-5 ✓	

Instead,

$$\int_0^1 xe^{-x^2}dx = \frac{\boxed{\text{e}}}{\boxed{\text{f}}} + \frac{\boxed{\text{g}}}{\boxed{\text{h}}}e^{-1}$$

, one can calculate this by substition.

$\boxed{\text{e}}$:

NUMERICAL | 1 point

1 ✓	

f:

NUMERICAL | 1 point

2 ✓	

g:

NUMERICAL | 1 point

-1 ✓	

h:

NUMERICAL | 1 point

2 ✓	

(8) **Q4**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly** 0 **or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us calculate the following integral.

$$\int_0^2 x^2 \exp(-x) dx.$$

It is easy to find a primitive of $\exp(-x)$. By integration by parts, one has

$$\int_0^2 x^2 \exp(-x) = \Big[\boxed{a}\Big]_0^2 - \int_0^2 \boxed{b} dx.$$

Choose the function $\boxed{a}$,

MULTI | 2 points | Single

- $\exp(-x)$
- $2x \exp(-x)$
- $x^2 \exp(-x)$
- $-\exp(-x)$
- $-2x \exp(-x)$
- $-x^2 \exp(-x)$ ✓

and $\boxed{b}$.

MULTI | 2 points | Single

- $\exp(-x)$
- $2x \exp(-x)$

- $x^2 \exp(-x)$
- $-\exp(-x)$
- $-2x \exp(-x)$ ✓
- $-x^2 \exp(-x)$

Continuing, one has $\int_0^2 x^2 \exp(-x) = \boxed{c} e^{-2} + \boxed{d}$.

$\boxed{c}$:

NUMERICAL | 2 points

-10 ✓	

$\boxed{d}$:

NUMERICAL | 2 points

2 ✓	

Instead,

$$\int_0^1 x e^{-x^2} dx = \frac{\boxed{e}}{\boxed{f}} e^{-1} + \frac{\boxed{g}}{\boxed{h}}$$

, one can calculate this by substition.

$\boxed{e}$:

NUMERICAL | 1 point

-1 ✓	

$\boxed{f}$:

NUMERICAL | 1 point

2 ✓	

$\boxed{g}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{h}$:

NUMERICAL | 1 point

2 ✓	

(9) **Q5**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly 0 or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{a}}{\boxed{b}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us calculate the following improper integral with various $\alpha, \beta \in \mathbb{R}$, as follows

$$\int_{\beta}^{\infty} x^3 \exp(\alpha x^4) dx$$

.

$\frac{\boxed{\text{a}}}{\boxed{\text{b}}\alpha} \exp(\alpha x^4)$ is a primitive of $x^3 \exp(\alpha x^4)$ if $\alpha \neq 0$.

a:

NUMERICAL | 2 points

1 ✓	

b:

NUMERICAL | 2 points

4 ✓	

The above improper integral converges for the following α, β.

MULTI | 8 points | Single | Shuffle

- $\alpha > -\frac{1}{4}$
- $\alpha < -\frac{1}{4}$
- $\alpha > -1$
- $\alpha < -1$
- $\alpha > 0$
- $\alpha < 0$ ✓
- $\alpha > 1$
- $\alpha < 1$
- $\alpha > \frac{1}{4}$
- $\alpha < \frac{1}{4}$
- all $\alpha \in \mathbb{R}$

and

MULTI | 4 points | Single | Shuffle

- $\beta > -e$
- $\beta < -e$
- $\beta > -1$
- $\beta < -1$
- $\beta > 0$
- $\beta < 0$
- $\beta > 1$
- $\beta < 1$
- $\beta > e$
- $\beta < e$
- all $\beta \in \mathbb{R}$ ✓

Take α, β for which the integral converges. In such a case, the value of the integral is $-\frac{\boxed{\text{c}}}{\boxed{\text{d}}\alpha} \exp(\alpha\beta^{\boxed{\text{e}}})$.

$\boxed{\text{c}}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{\text{d}}$:

NUMERICAL | 1 point

4 ✓	

$\boxed{\text{e}}$:

NUMERICAL | 2 points

4 ✓	

For α as above, si ottiene

$$\int_{-\infty}^{\infty} x^3 \exp(\alpha x^4) dx = \boxed{\text{f}}.$$

$\boxed{\text{f}}$:

NUMERICAL | 4 points

0 ✓	

(10) **Q5**

CLOZE | 0.10 penalty

If not specified otherwise, fill in the blanks with **integers (possibly** 0 **or negative)**. A fraction should be **reduced** (for example, $\frac{1}{2}$ is accepted but not $\frac{2}{4}$), and if it is negative and the answer boxes (such as $\frac{\boxed{\text{a}}}{\boxed{\text{b}}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not). $\log x = \log_e x$, not $\log_{10} x$.

Let us calculate the following improper integral with various $\alpha, \beta \in \mathbb{R}$, as follows

$$\int_{\beta}^{\infty} x^5 \exp(\alpha x^6) dx$$

.

$\frac{\boxed{\text{a}}}{\boxed{\text{b}}\alpha} \exp(\alpha x^4)$ is a primitive of $x^3 \exp(\alpha x^4)$ if $\alpha \neq 0$.

$\boxed{\text{a}}$:

NUMERICAL | 2 points

1 ✓	

$\boxed{\text{b}}$:

NUMERICAL | 2 points

6 ✓	

The above improper integral converges for the following α, β.

MULTI | 8 points | Single | Shuffle

- $\alpha > -\frac{1}{4}$
- $\alpha < -\frac{1}{4}$
- $\alpha > -1$
- $\alpha < -1$
- $\alpha > 0$
- $\alpha < 0$ ✓
- $\alpha > 1$
- $\alpha < 1$
- $\alpha > \frac{1}{4}$
- $\alpha < \frac{1}{4}$
- all $\alpha \in \mathbb{R}$

and

MULTI | 4 points | Single | Shuffle

- $\beta > -e$
- $\beta < -e$
- $\beta > -1$
- $\beta < -1$
- $\beta > 0$
- $\beta < 0$
- $\beta > 1$
- $\beta < 1$
- $\beta > e$
- $\beta < e$
- all $\beta \in \mathbb{R}$ ✓

Take α, β for which the integral converges. In such a case, the value of the integral is $-\frac{\boxed{c}}{\boxed{d}\alpha} \exp(\alpha\beta^{\boxed{e}})$.

$\boxed{c}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{d}$:

NUMERICAL | 1 point

6 ✓	

$\boxed{e}$:

NUMERICAL | 2 points

6 ✓	

For α as above, si ottiene

$$\int_{-\infty}^{\infty} x^3 \exp(\alpha x^4) dx = \boxed{\text{f}}.$$

$\boxed{\text{f}}$:

NUMERICAL | 4 points

0 ✓	

Total of marks: 216