2022Call1.

(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).

Let us study the limit $\lim_{x\to 0} \frac{\exp x - x(1+x)^{\frac{1}{3}} + \alpha}{\log(1+2x^2)+\beta}$.
Complete the formulae.

$$\exp x = \boxed{a} + \boxed{b}x + \frac{\boxed{c}}{\boxed{d}}x^2 + o(x^2) \text{ as } x \to 0.$$

$\boxed{a}$:

NUMERICAL | 2 points

1 ✓	

$\boxed{b}$:

NUMERICAL | 2 points

1 ✓	

$\boxed{c}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{d}$:

NUMERICAL | 1 point

2 ✓	

$$x(1+x)^{\frac{1}{3}} = \boxed{e} + \boxed{f}x + \frac{\boxed{g}}{\boxed{h}}x^2 + o(x^2) \text{ as } x \to 0.$$

$\boxed{e}$:

NUMERICAL | 2 points

0 ✓	

$\boxed{f}$:

NUMERICAL | 2 points

1 ✓	

g:

NUMERICAL | 1 point

1 ✓	

h:

NUMERICAL | 1 point

3 ✓	

$$\log(1+2x^2) = \boxed{\text{i}} + \boxed{\text{j}}\,x + \boxed{\text{k}}\,x^2 + o(x^2) \text{ as } x \to 0.$$

i:

NUMERICAL | 2 points

0 ✓	

j:

NUMERICAL | 2 points

0 ✓	

k:

NUMERICAL | 2 points

2 ✓	

Consider the limit

$$\lim_{x\to 0} \frac{\exp x - x(1+x)^{\frac{1}{3}} + \alpha}{\log(1+2x^2) + \beta}.$$

If $\alpha = 1$ there is only one value of $\beta = \boxed{\text{l}}$ such that the limit does not exist.

l:

NUMERICAL | 6 points

0 ✓	

If $\beta = 0$, this limit converges for $\alpha = \boxed{\text{m}}$.

m:

NUMERICAL | 6 points

-1 ✓	

In that case, the limit is $\dfrac{\boxed{\text{n}}}{\boxed{\text{o}}}$.

n:

NUMERICAL | 3 points

1 ✓	

o:

NUMERICAL | 3 points

12 ✓	

(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).

Let us study the limit $\lim_{x\to 0} \frac{\exp(3x)-3x(1+x)^{\frac{1}{3}}+\alpha}{\log(1+x^2)+\beta}$.
Complete the formulae.

$$\exp(3x) = \boxed{a} + \boxed{b}x + \frac{\boxed{c}}{\boxed{d}}x^2 + o(x^2) \text{ as } x \to 0.$$

$\boxed{a}$:

NUMERICAL | 2 points

1 ✓	

$\boxed{b}$:

NUMERICAL | 2 points

3 ✓	

$\boxed{c}$:

NUMERICAL | 1 point

9 ✓	

$\boxed{d}$:

NUMERICAL | 1 point

2 ✓	

$$x(1+x)^{\frac{1}{3}} = \boxed{e} + \boxed{f}x + \frac{\boxed{g}}{\boxed{h}}x^2 + o(x^2) \text{ as } x \to 0.$$

$\boxed{e}$:

NUMERICAL | 2 points

0 ✓	

$\boxed{f}$:

NUMERICAL | 2 points

1 ✓	

g:

NUMERICAL | 1 point

1 ✓	

h:

NUMERICAL | 1 point

3 ✓	

$$\log(1+x^2) = \boxed{\text{i}} + \boxed{\text{j}}x + \boxed{\text{k}}x^2 + o(x^2) \text{ as } x \to 0.$$

i:

NUMERICAL | 2 points

0 ✓	

j:

NUMERICAL | 2 points

0 ✓	

k:

NUMERICAL | 2 points

1 ✓	

Consider the limit

$$\lim_{x\to 0} \frac{\exp(3x) - 3x(1+x)^{\frac{1}{3}} + \alpha}{\log(1+x^2) + \beta}.$$

If $\alpha = 1$ there is only one value of $\beta = \boxed{\text{l}}$ such that the limit does not exist.

l:

NUMERICAL | 6 points

0 ✓	

If $\beta = 0$, this limit converges for $\alpha = \boxed{\text{m}}$.

m:

NUMERICAL | 6 points

-1 ✓	

In that case, the limit is $\frac{\boxed{\text{n}}}{\boxed{\text{o}}}$.

n:

NUMERICAL | 3 points

7 ✓	

o:

NUMERICAL | 3 points

2 ✓	

(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).

Let us study the following series $\sum_{n=0}^{\infty} \frac{8^n}{\sqrt{n^2+1}}(x+1)^{3n}$, with various x.

This series makes sense also for $x \in \mathbb{C}$. For $x = -1 + i$, calculate the partial sum $\sum_{n=0}^{1} \frac{8^n}{\sqrt{n^2+1}}(x+1)^{3n} = \boxed{a} + \boxed{b}\sqrt{\boxed{c}}i$.

$\boxed{a}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{b}$:

NUMERICAL | 2 points

-4 ✓	

$\boxed{c}$:

NUMERICAL | 1 point

2 ✓	

In order to discuss the convergence using the ratio test for $x \in \mathbb{R}$, we put $a_n = \frac{8^n}{\sqrt{n^2+1}}|x+1|^{3n}$. Complete the formula.

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

$\boxed{d}$:

NUMERICAL | 2 points

8 ✓	

$\boxed{e}$:

NUMERICAL | 1 point

1 ✓	

$\boxed{f}$:

NUMERICAL | 1 point

3 ✓	

Therefore, by the ratio test, the series converges absolutely for $\frac{\boxed{\text{g}}}{\boxed{\text{h}}} < x < \frac{\boxed{\text{i}}}{\boxed{\text{j}}}$:

$\boxed{\text{g}}$:

NUMERICAL | 2 points

-3 ✓	

$\boxed{\text{h}}$:

NUMERICAL | 2 points

2 ✓	

$\boxed{\text{i}}$:

NUMERICAL | 2 points

-1 ✓	

$\boxed{\text{j}}$:

NUMERICAL | 2 points

2 ✓	

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

MULTI | 4 points | Single

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

For the case $x = 1$, the series

MULTI | 4 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 $\frac{\boxed{\text{a}}}{\boxed{\text{b}}}$) have ambiguity, the negative sign should be put on the numerator (for example $\frac{-1}{2}$ is accepted but $\frac{1}{-2}$ is not).

Let us study the following series $\sum_{n=0}^{\infty} \frac{8^n}{\sqrt{n^2+1}}(x-1)^{3n}$, with various x.

This series makes sense also for $x \in \mathbb{C}$. For $x = 1-i$, calculate the partial sum $\sum_{n=0}^{1} \frac{8^n}{\sqrt{n^2+1}}(x-1)^{3n} = \boxed{\text{a}} + \boxed{\text{b}}\sqrt{\boxed{\text{c}}}i$.

[a]:

NUMERICAL | 1 point

1 ✓	

[b]:

NUMERICAL | 2 points

4 ✓	

[c]:

NUMERICAL | 1 point

2 ✓	

In order to discuss the convergence using the ratio test for $x \in \mathbb{R}$, we put $a_n = \frac{8^n}{\sqrt{n^2+1}}|x-1|^{3n}$. Complete the formula.

$$\lim_{n\to\infty} \frac{a_{n+1}}{a_n} = \boxed{\text{d}}|x + \boxed{\text{e}}|^{\boxed{\text{f}}}.$$

[d]:

NUMERICAL | 2 points

8 ✓	

[e]:

NUMERICAL | 1 point

-1 ✓	

[f]:

NUMERICAL | 1 point

3 ✓	

Therefore, by the ratio test, the series converges absolutely for $\frac{\boxed{\text{g}}}{\boxed{\text{h}}} < x < \frac{\boxed{\text{i}}}{\boxed{\text{j}}}$:

[g]:

NUMERICAL | 2 points

1 ✓	

[h]:

NUMERICAL | 2 points

2 ✓	

[i]:

NUMERICAL | 2 points

3 ✓	

[j]:

NUMERICAL | 2 points

2 ✓	

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

MULTI | 4 points | Single

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

For the case $x = 1$, the series

MULTI | 4 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 $\frac{\boxed{\text{a}}}{\boxed{\text{b}}}$) 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 consider the following function

$$f(x) = \frac{x^3}{x^2 + 3x + 2}.$$

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

- -2 ✓
- -1 ✓
- $-\frac{1}{2}$ (-100%)
- 0 (-100%)
- $\frac{1}{2}$ (-100%)
- 1 (-100%)
- 2 (-100%)

Choose all asymptotes of $f(x)$.

MULTI | 4 points | Single

- $y = -1$ (-100%)
- $y = -\frac{1}{2}$ (-100%)
- $y = 0$ (-100%)
- $y = \frac{1}{2}$ (-100%)

- $y = 2$ (-100%)
- $x = -2$ ✓
- $x = -1$ ✓
- $x = -\frac{1}{2}$ (-100%)
- $x = 0$ (-100%)
- $x = \frac{1}{2}$ (-100%)
- $x = 1$ (-100%)
- $x = 2$ (-100%)
- $y = x + 3$ (-100%)
- $y = x + 1$ (-100%)
- $y = x - 1$ (-100%)
- $y = x - 3$ ✓

One has

$$f'(1) = \frac{\boxed{\text{a}}}{\boxed{\text{b}}}.$$

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

NUMERICAL | 4 points

13 ✓	

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

NUMERICAL | 4 points

36 ✓	

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

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

NUMERICAL | 4 points

3 ✓	

Choose the behaviour of $f(x)$ in the interval $(-5, -4)$.

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 $\frac{\boxed{\text{a}}}{\boxed{\text{b}}}$) 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 consider the following function

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

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

- -2 (-100%)
- -1 (-100%)
- $-\frac{1}{2}$ (-100%)
- 0 (-100%)
- $\frac{1}{2}$ (-100%)
- 1 ✓
- 2 ✓

Choose all asymptotes of $f(x)$.

MULTI | 4 points | Single

- $y = -1$ (-100%)
- $y = -\frac{1}{2}$ (-100%)
- $y = 0$ (-100%)
- $y = \frac{1}{2}$ (-100%)
- $y = 2$ (-100%)
- $x = -2$ (-100%)
- $x = -1$ (-100%)
- $x = -\frac{1}{2}$ (-100%)
- $x = 0$ (-100%)
- $x = \frac{1}{2}$ (-100%)
- $x = 1$ ✓
- $x = 2$ ✓
- $y = x + 3$ ✓
- $y = x + 1$ (-100%)
- $y = -x - 1$ (-100%)
- $y = -x - 3$ (-100%)

One has

$$f'(3) = \frac{\boxed{a}}{\boxed{b}}.$$

$\boxed{a}$:

NUMERICAL | 4 points

-27 ✓	

$\boxed{b}$:

NUMERICAL | 4 points

4 ✓	

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

c:

NUMERICAL 4 points

3 ✓	

Choose the behaviour of $f(x)$ in the interval $(-5, -4)$.

MULTI 4 points Single

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

(7) **Q4**

CLOZE 0.10 penalty

Let us calculate the following integral.

$$\int_0^{\frac{\pi}{2}} \sin(x)\cos\left(x+\frac{\pi}{6}\right)dx.$$

Complete the formula

$$\cos\left(x+\frac{\pi}{6}\right) = \frac{\sqrt{\boxed{a}}}{\boxed{b}}\cos x + \frac{\boxed{c}}{\boxed{d}}\sin x.$$

a:

NUMERICAL 2 points

3 ✓	

b:

NUMERICAL 2 points

2 ✓	

c:

NUMERICAL 2 points

-1 ✓	

d:

NUMERICAL 2 points

2 ✓	

Choose a primitive of $\sin(x)\cos(x)$.

MULTI 8 points Single

- $\frac{1}{3}\cos^3(x)\sin(x)$
- $-\frac{1}{3}\cos^3(x)\sin(x)$
- $\frac{1}{3}\sin^3(x)$
- $-\frac{1}{3}\sin^3(x)$
- $\frac{1}{2}\cos^2(x)$

- $\frac{1}{2}\sin^2(x)$ ✓
- $-\frac{1}{2}\sin^2(x)$
- $\frac{1}{3}\sin^2\cos(x)$
- $-\frac{1}{3}\sin^2\cos(x)$

Choose a primitive of $\sin^2(x)$.

MULTI | 8 points | Single

- $\sin^3(x)/3$
- $\cos^3(x)/3$
- $x\sin^2(x)$
- $x\cos^2(x)$
- $\sin(x)\cos(x)$
- $\sin^2(x)\cos(x)/2$
- $\sin(x)\cos^2(x)/2$
- $x/2+\cos(2x)/4$
- $x/2-\sin(2x)/4$ ✓

By continuing, we get

$$\int_0^{\frac{\pi}{2}} \sin(x)\cos\left(x+\frac{\pi}{6}\right)dx = \frac{\sqrt{\boxed{e}}}{\boxed{f}} + \frac{\boxed{g}}{\boxed{h}}\pi$$

.

e:

NUMERICAL | 6 points

3 ✓	

f:

NUMERICAL | 6 points

4 ✓	

g:

NUMERICAL | 3 points

-1 ✓	

h:

NUMERICAL | 3 points

8 ✓	

(8) **Q4**

CLOZE | 0.10 penalty

Let us calculate the following integral.

$$\int_0^{\frac{\pi}{6}} \sin(x)\cos\left(x+\frac{\pi}{6}\right)dx.$$

Complete the formula

$$\cos\left(x+\frac{\pi}{6}\right)=\frac{\sqrt{\boxed{\text{a}}}}{\boxed{\text{b}}}\cos x+\frac{\boxed{\text{c}}}{\boxed{\text{d}}}\sin x.$$

a:

NUMERICAL | 2 points

3 ✓	

b:

NUMERICAL | 2 points

2 ✓	

c:

NUMERICAL | 2 points

-1 ✓	

d:

NUMERICAL | 2 points

2 ✓	

Choose a primitive of $\sin^2(x)$.

MULTI | 8 points | Single

- $\sin^3(x)/3$
- $\cos^3(x)/3$
- $x\sin^2(x)$
- $x\cos^2(x)$
- $\sin(x)\cos(x)$
- $\sin^2(x)\cos(x)/2$
- $\sin(x)\cos^2(x)/2$
- $x/2+\cos(2x)/4$
- $x/2-\sin(2x)/4$ ✓

Choose a primitive of $\sin(x)\cos(x)$.

MULTI | 8 points | Single

- $\frac{1}{3}\cos^3(x)\sin(x)$
- $-\frac{1}{3}\cos^3(x)\sin(x)$
- $\frac{1}{3}\sin^3(x)$
- $-\frac{1}{3}\sin^3(x)$
- $\frac{1}{2}\cos^2(x)$
- $\frac{1}{2}\sin^2(x)$ ✓
- $-\frac{1}{2}\sin^2(x)$
- $\frac{1}{3}\sin^2\cos(x)$
- $-\frac{1}{3}\sin^2\cos(x)$

By continuing, we get

$$\int_0^{\frac{\pi}{6}} \sin(x)\cos\left(x+\frac{\pi}{6}\right)dx = \frac{\sqrt{\boxed{\text{e}}}}{\boxed{\text{f}}} + \frac{\boxed{\text{g}}}{\boxed{\text{h}}}\pi$$

.

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

NUMERICAL | 6 points

3 ✓	

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

NUMERICAL | 6 points

8 ✓	

$\boxed{\text{g}}$:

NUMERICAL | 3 points

-1 ✓	

$\boxed{\text{h}}$:

NUMERICAL | 3 points

24 ✓	

(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 $\frac{\boxed{\text{a}}}{\boxed{\text{b}}}$) 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 $\log_{10} x$.

Choose the general solution of the following differential equation.

$$y'(x) = y(x)\cos(\log x)/x.$$

MULTI | 2 points | Single

- $y(x) = \sin(\log x) + C$
- $y(x) = \cos(1/x) + C$
- $y(x) = \log\cos(x) + C$
- $y(x) = \exp(\cos(\log x)) + C$
- $y(x) = \sin(\log x + C)$
- $y(x) = \cos(1/x + C)$
- $y(x) = \log(\cos(x) + C)$
- $y(x) = \exp(\sin(\log x) + C)$ ✓

Determine $C = \boxed{\text{a}}$ with the initial condition $y(1) = 1$

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

NUMERICAL | 2 points

0 ✓	

Choose the general solution of the following differential equation.

$$y''(x) + y'(x) - 6y(x) = 0.$$

MULTI | 2 points | Single

- $y(x) = C_1 \exp(-3x) + C_2 \exp(2x)$ ✓
- $y(x) = C_1 \exp(-2x) + C_2 \exp(3x)$
- $y(x) = C_1 \exp(-x) + C_2 \exp(6x)$
- $y(x) = C_1 \exp(-6x) + C_2 \exp(1x)$
- $y(x) = C_1 \sin(-3x) + C_2 \cos(2x)$
- $y(x) = C_1 \sin(-2x) + C_2 \cos(3x)$
- $y(x) = C_1 \sin(-x) + C_2 \cos(6x)$
- $y(x) = C_1 \sin(-6x) + C_2 \cos(1x)$

Find a solution $y(x)$ such that $y(0) = 3$ and $\lim_{x\to\infty} y(x) = 0$. $C_1 = \boxed{a}, C_2 = \boxed{b}$.

$\boxed{b}$:

NUMERICAL | 2 points

3 ✓	

$\boxed{c}$:

NUMERICAL | 2 points

0 ✓	

For general values of C_1, C_2, choose a correct statement.

MULTI | 2 points | Single

- As $x \to \infty$, the solution converges to 0 for all C_1, C_2.
- As $x \to \infty$, the solution converges to 0 only for some C_1, C_2. ✓
- As $x \to \infty$, the solution never converges to 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 $\frac{\boxed{a}}{\boxed{b}}$) 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 $\log_{10} x$.

Choose the general solution of the following differential equation.

$$y'(x) = y(x) \cos(\log x)/x.$$

MULTI | 2 points | Single

- $y(x) = \sin(\log x) + C$
- $y(x) = \cos(1/x) + C$
- $y(x) = \log\cos(x) + C$
- $y(x) = \exp(\cos(\log x)) + C$
- $y(x) = \sin(\log x + C)$
- $y(x) = \cos(1/x + C)$
- $y(x) = \log(\cos(x) + C)$
- $y(x) = \exp(\sin(\log x) + C)$ ✓

Determine $C =$ [a] with the initial condition $y(1) = e$

[a]:

NUMERICAL | 2 points

1 ✓	

Choose the general solution of the following differential equation.

$$y''(x) - y'(x) - 6y(x) = 0.$$

MULTI | 2 points | Single

- $y(x) = C_1 \exp(-3x) + C_2 \exp(2x)$
- $y(x) = C_1 \exp(-2x) + C_2 \exp(3x)$ ✓
- $y(x) = C_1 \exp(-x) + C_2 \exp(6x)$
- $y(x) = C_1 \exp(-6x) + C_2 \exp(1x)$
- $y(x) = C_1 \sin(-3x) + C_2 \cos(2x)$
- $y(x) = C_1 \sin(-2x) + C_2 \cos(3x)$
- $y(x) = C_1 \sin(-x) + C_2 \cos(6x)$
- $y(x) = C_1 \sin(-6x) + C_2 \cos(1x)$

Find a solution $y(x)$ such that $y(0) = 4$ and $\lim_{x\to-\infty} y(x) = 0$. $C_1 =$ [a], $C_2 =$ [b].

[b]:

NUMERICAL | 2 points

0 ✓	

[c]:

NUMERICAL | 2 points

4 ✓	

For general values of C_1, C_2, choose a correct statement.

MULTI | 2 points | Single

- As $x \to -\infty$, the solution converges to 0 for all C_1, C_2.
- As $x \to -\infty$, the solution converges to 0 only for some C_1, C_2. ✓
- As $x \to -\infty$, the solution never converges to 0.

Total of marks: 276