



# Prelims

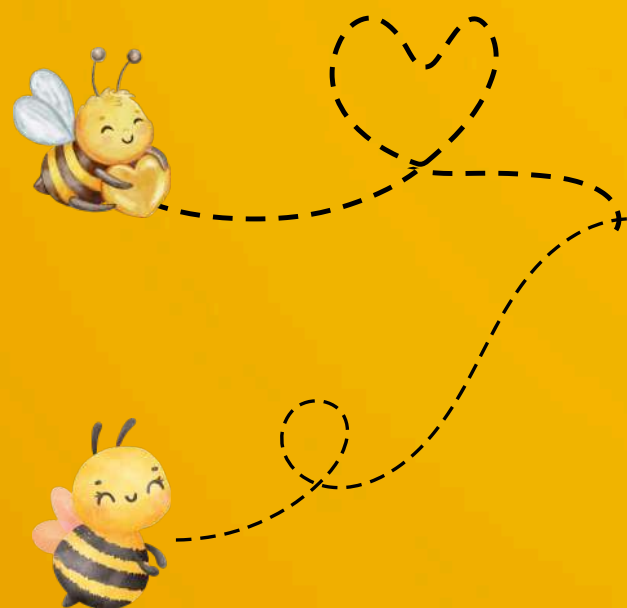
- The prelims will be conducted on the Unstop platform.
- Duration: 45 minutes, starting 6:30 PM sharp.
- Ensure you save all your answers before the time ends.
- Top 24 students from the prelims will qualify for the elimination rounds.
- In case of any technical difficulty please raise your hand or reach out to us.





# Prelims

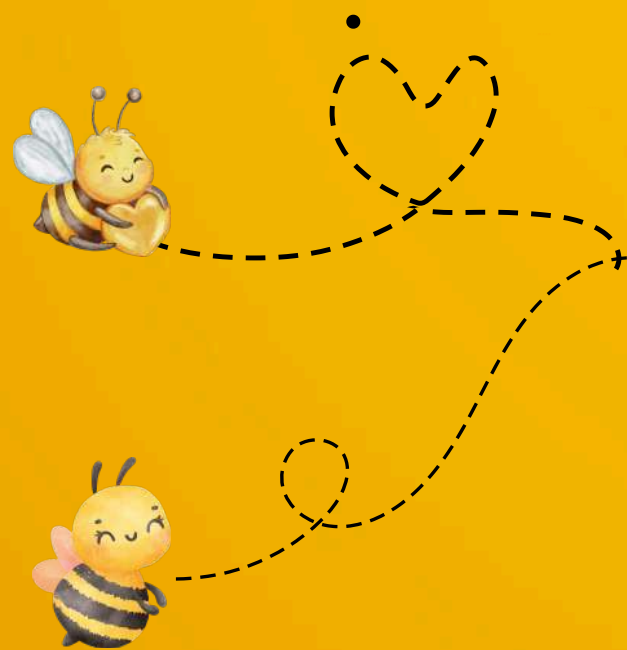
- The prelims will be conducted on the Unstop platform.
- Duration: 45 minutes, starting 6:30 PM sharp.
- Ensure you save all your answers before the time ends.
- Top 24 students from the prelims will qualify for the elimination rounds.
- In case of any technical difficulty please raise your hand or reach out to us.





## Round of 24

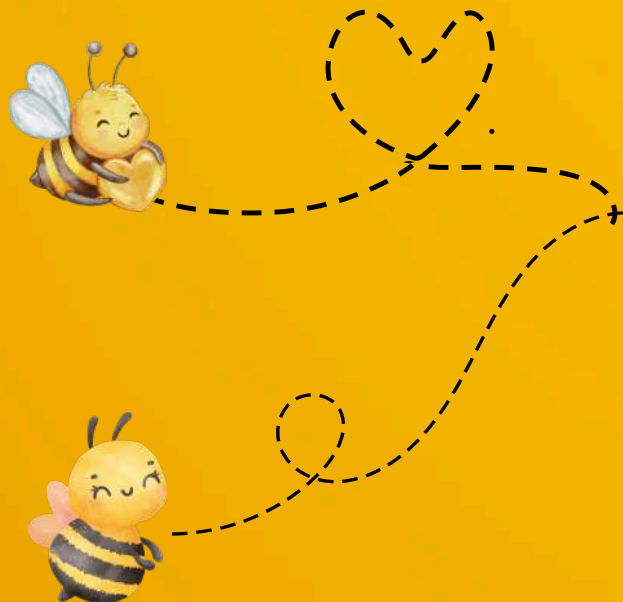
- **3 participants compete at a time.**
- **1 question is given.**
- **The participant who solves it correctly in the shortest time moves forward.**
- **The other two participants are eliminated.**







- You must encircle your final answer before submission.
- Only the answer inside the circle will be considered; calculations will not be checked.
- Once an answer is encircled, no changes can be made.
- If the encircled answer is correct, that participant wins the point.
- If the answer is incorrect, the opponent gets a chance to answer within 3 minutes.
- If all fail to get the correct answer within 3 minutes, no one gets the point.





- If a round ends in a tie, a tiebreaker question will be provided.
- The same rules apply; the participant who solves it correctly first wins.
- If neither gets it right within 3 minutes, the round remains undecided





Tie Breakers

# FINAL

## SEMI FINAL 1

## SEMI FINAL 2

Round of 8 M1

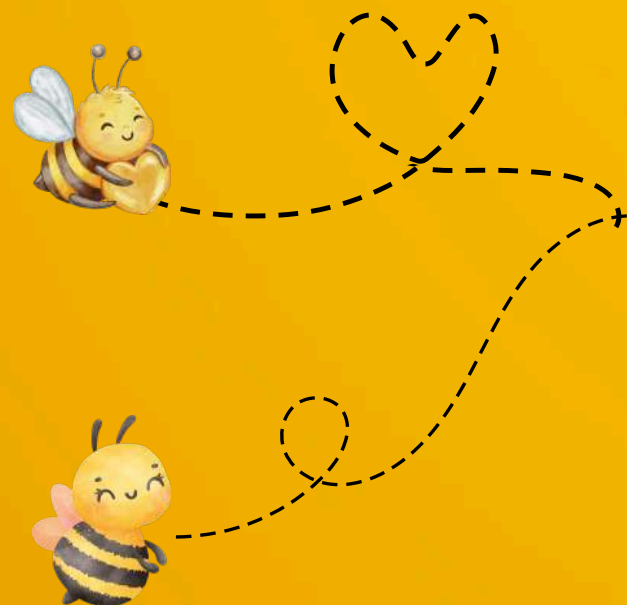
Round of 8 M2

Round of 8 M3

Round of 8 M4

Round of 24 M1 Round of 24 M2 Round of 24 M3 Round of 24 M4 Round of 24 M5 Round of 24 M6 Round of 24 M7 Round of 24 M8

*Integration Bee*



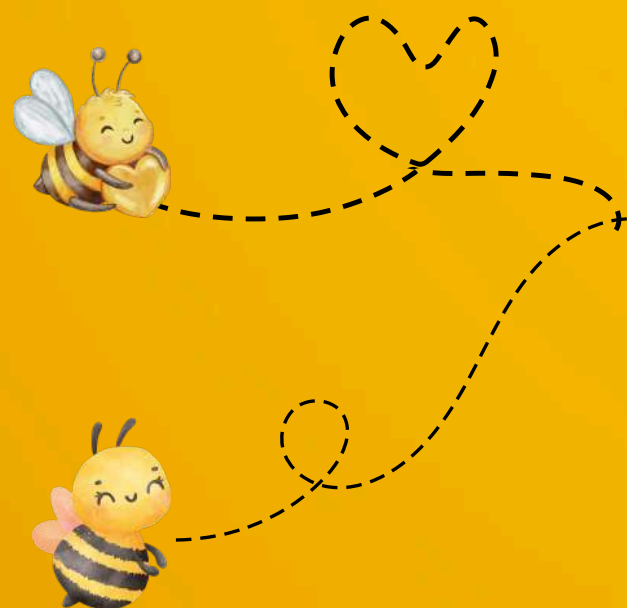




# Round of 24

## M1

*Integration Bee*



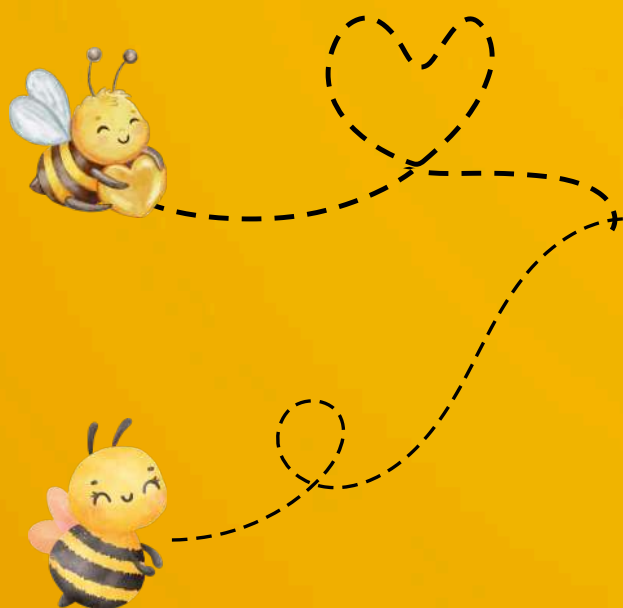


# Round of 24

Q.1

$$\int \frac{1}{(x^2 + 1)^2} dx$$

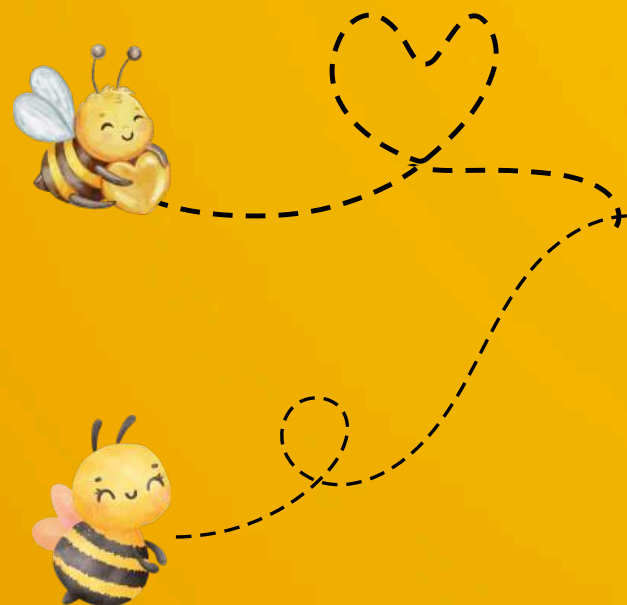
*Integration Bee*







# Safety Slide

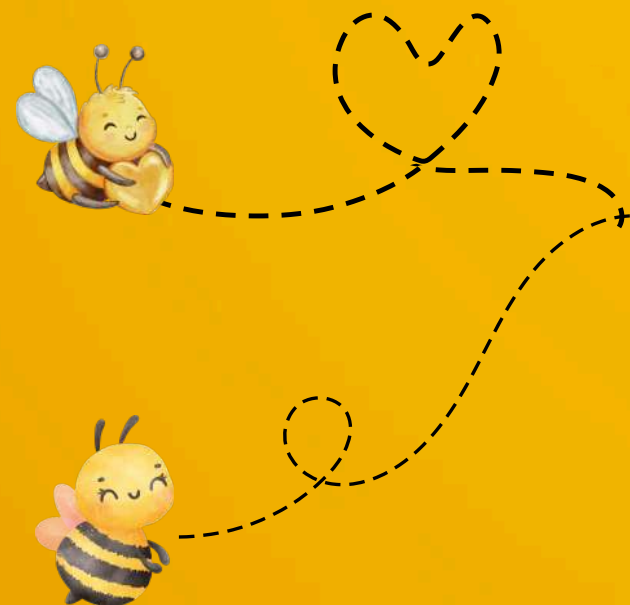




# Round of 24

A.1

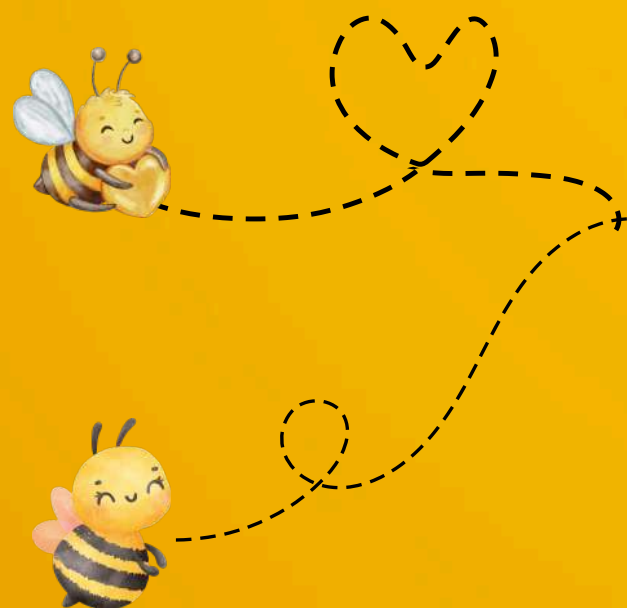
$$\frac{\tan^{-1} x}{2} + \frac{x}{x^2 + 1} + C$$



*Integration Bee*



# Safety Slide

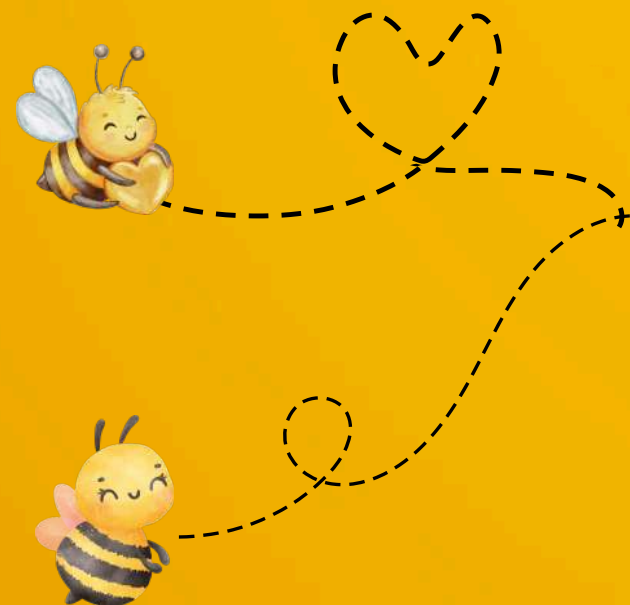






# Round of 24

## M2



*Integration Bee*

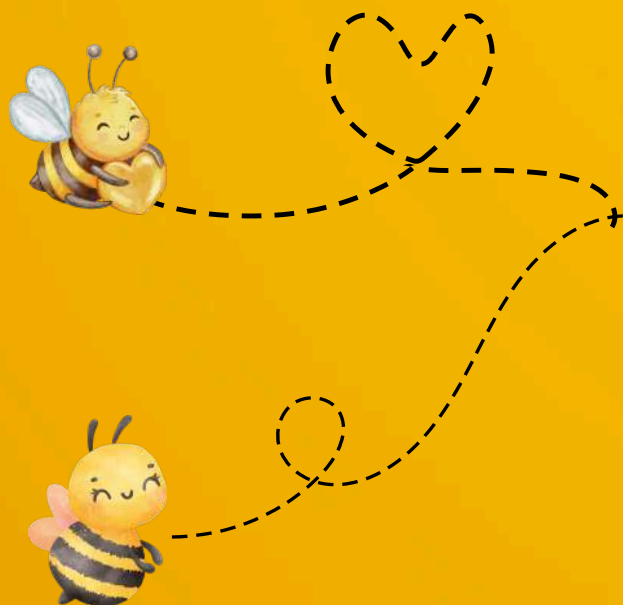


# Round of 24

Q.2

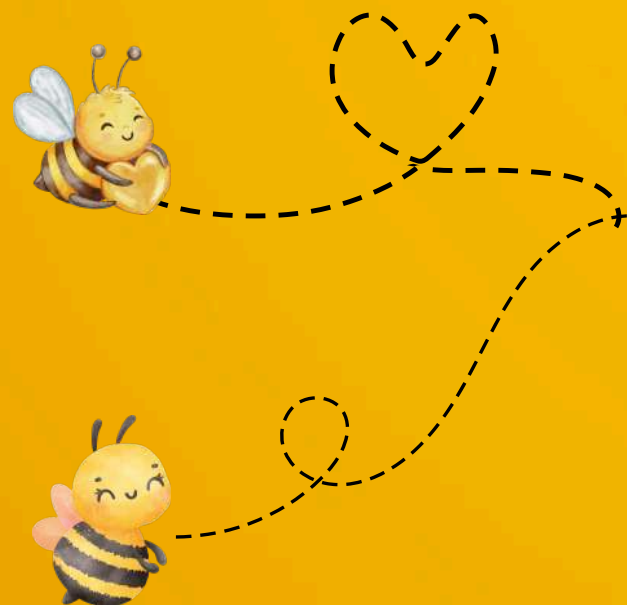
$$\int_0^1 \sin^2(\ln x) dx$$

*Integration Bee*





# Safety Slide





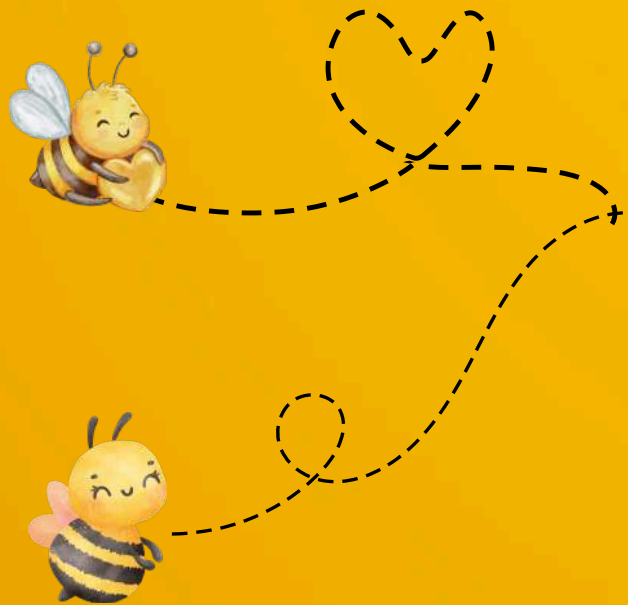


# Round of 24

A.2

$$\frac{2}{5}$$

*Integration Bee*





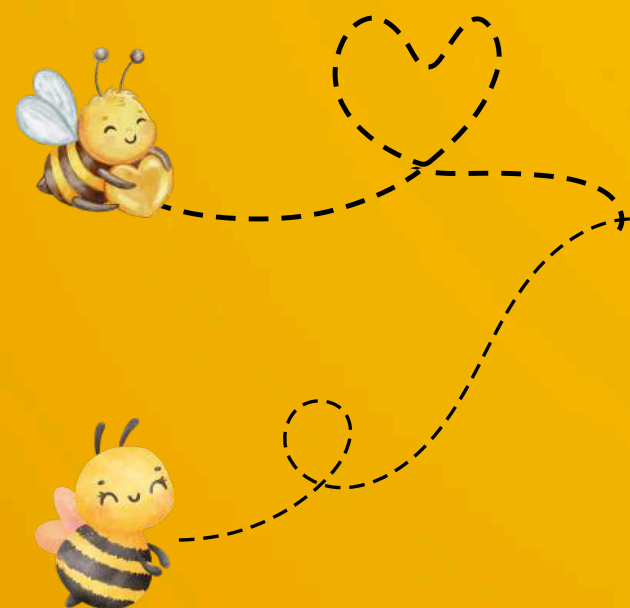
# Safety Slide





# Round of 24

## M3



*Integration Bee*





# Round of 24

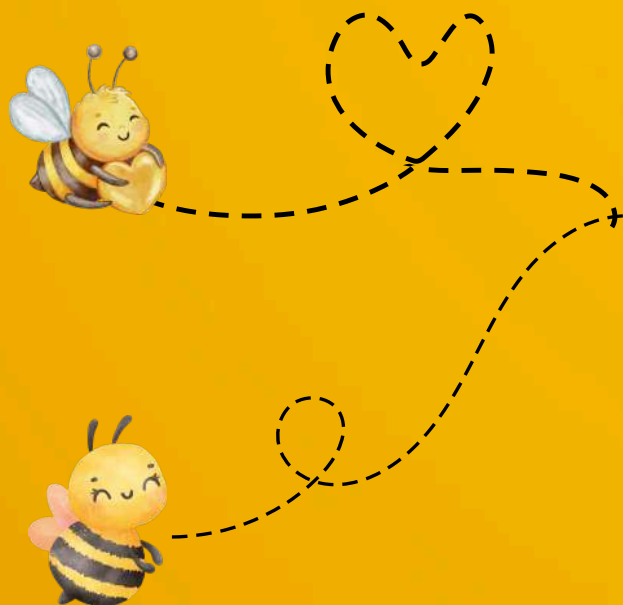
## Q.3

Let  $I(z)$  be defined as

$$I(z) = \int_0^{\infty} \frac{x}{z^{-1}e^x - 1} dx$$

Find  $\lim_{z \rightarrow 1^-} I(z)$ .

*Integration Bee*





# Safety Slide



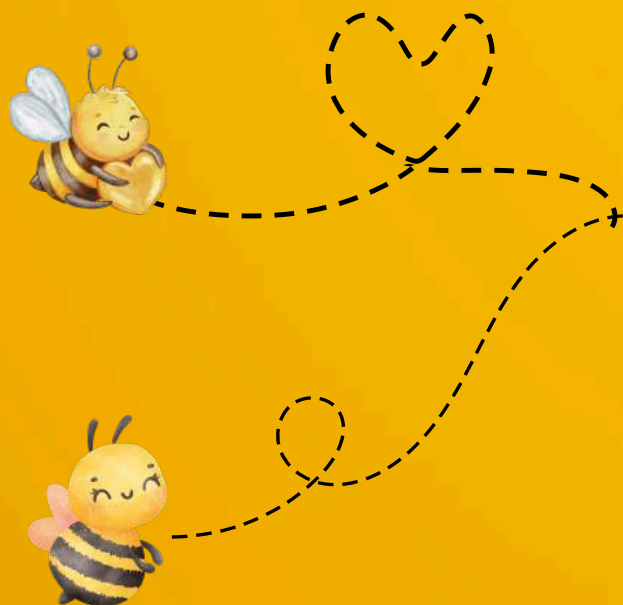


# Round of 24

A.3

$$\frac{\pi^2}{6}$$

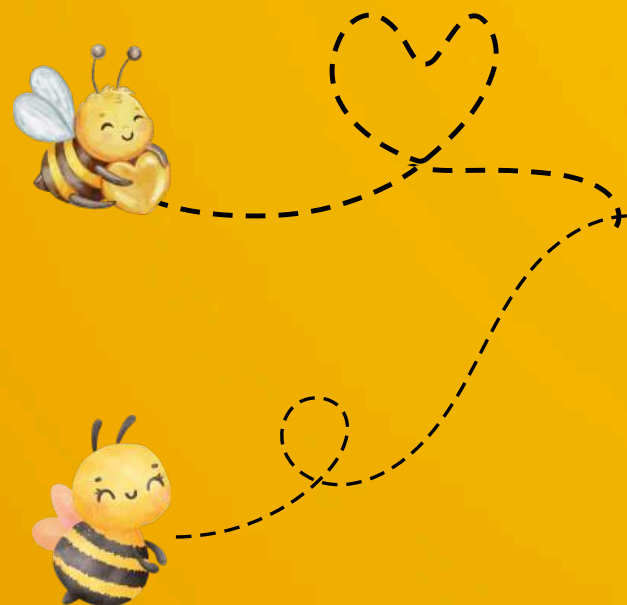
*Integration Bee*







# Safety Slide

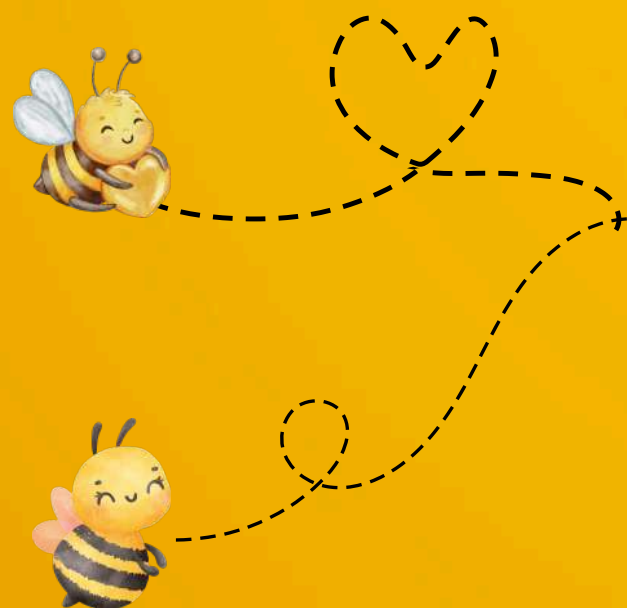




# Round of 24

## M4

*Integration Bee*



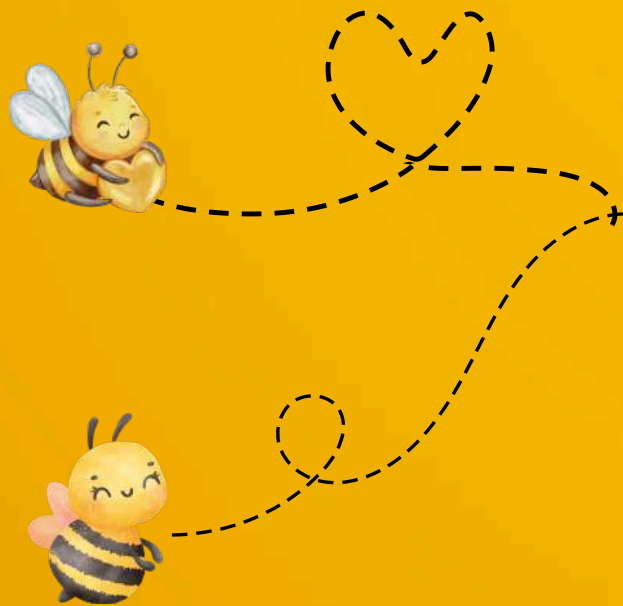


# Round of 24

Q.4

$$\int_0^{2\pi} \frac{dx}{3 + \cos x}$$

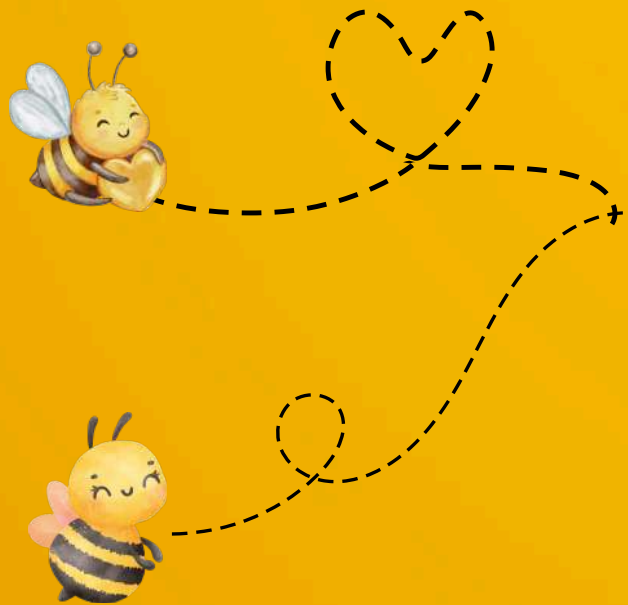
*Integration Bee*







# Safety Slide



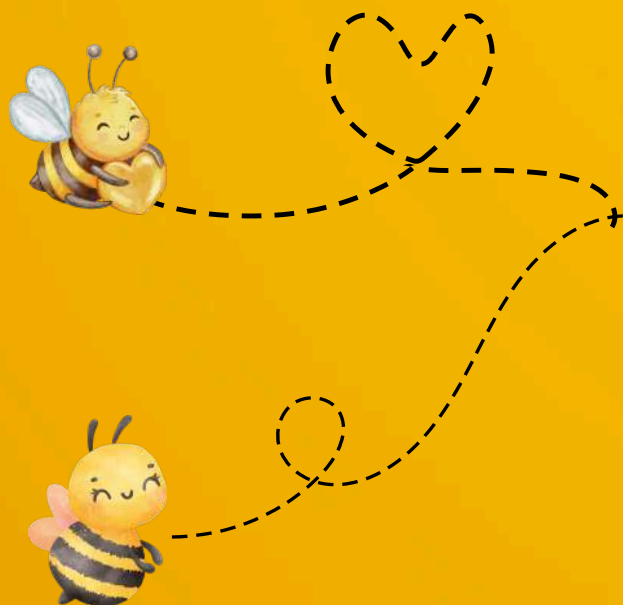


# Round of 24

A.4

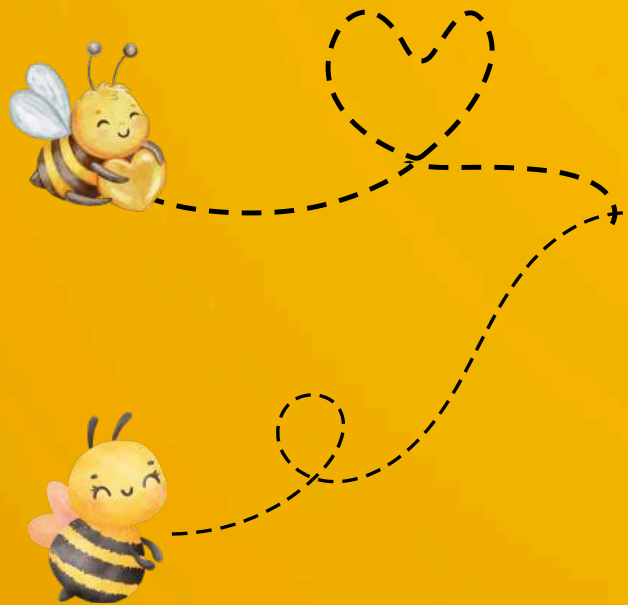
$$\frac{\pi}{\sqrt{2}}$$

*Integration Bee*





# Safety Slide

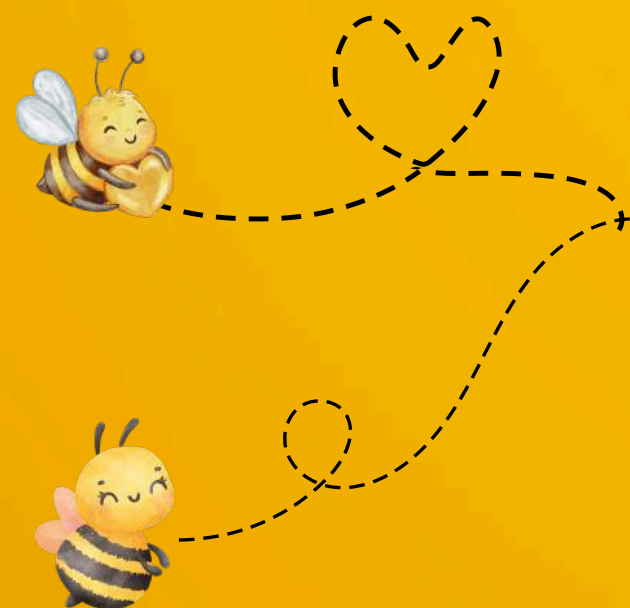






# Round of 24

## M5



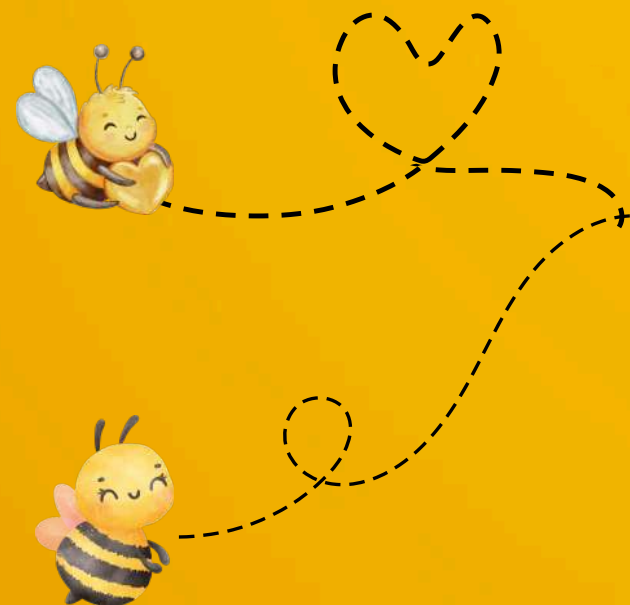
*Integration Bee*



# Round of 24

Q.5

$$\int_0^{\frac{\pi}{2}} \frac{2 + \ln(\tan \theta)}{2 + \sin(2\theta)} d\theta$$

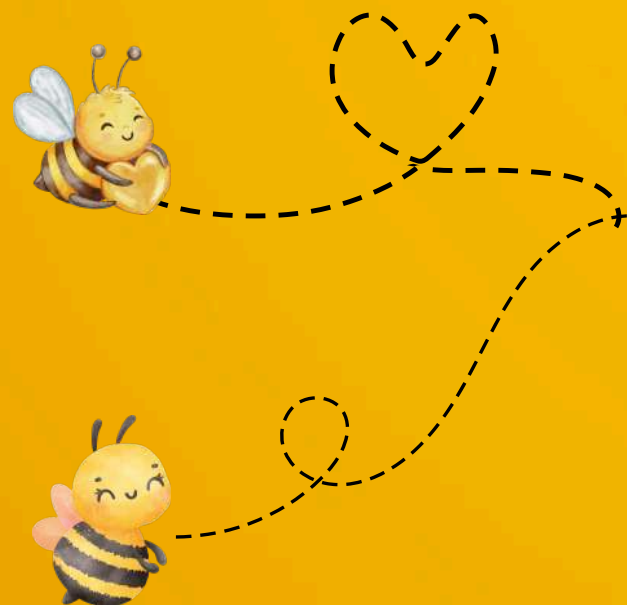


*Integration Bee*





# Safety Slide





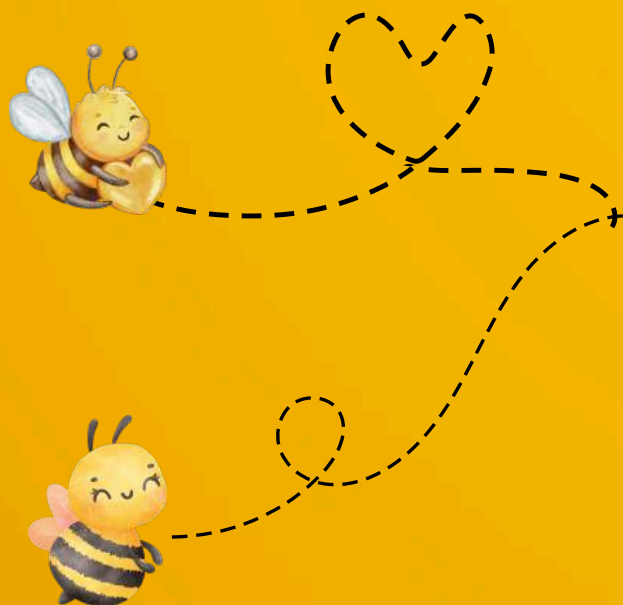


# Round of 24

A.5

$$\frac{2\pi}{3\sqrt{3}}$$

*Integration Bee*





# Safety Slide

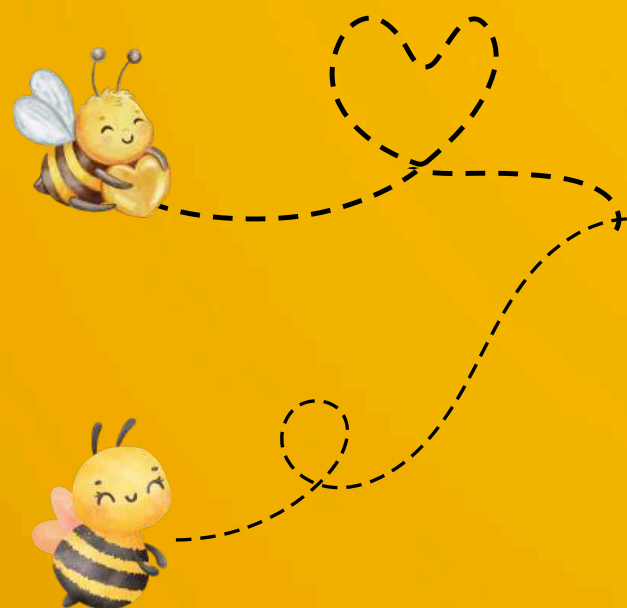




# Round of 24

## M6

*Integration Bee*





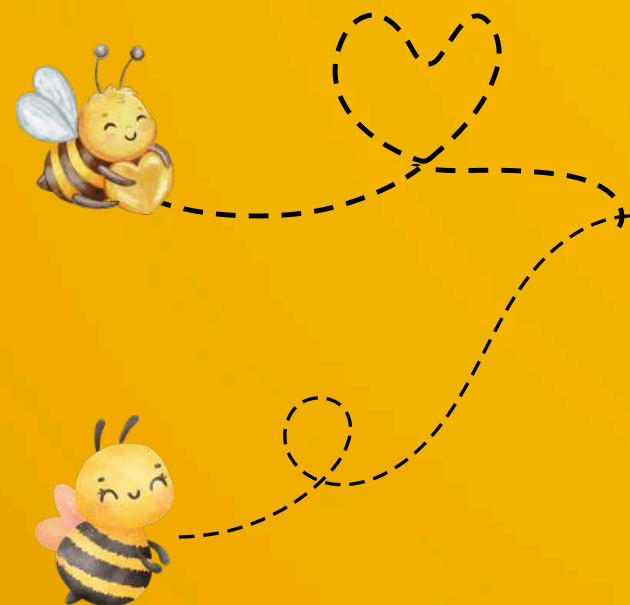


# Round of 24

## Q.6

Find  $k$ , where

$$\int_1^{\infty} \frac{\ln x}{x^2 + 1} dx = k \int_0^1 \frac{\tan^{-1} x}{2x} dx$$



*Integration Bee*



# Safety Slide



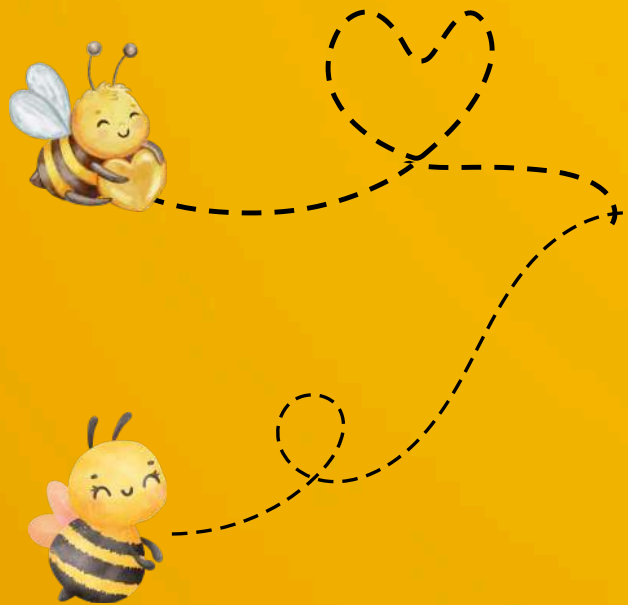


# Round of 24

A.6

2

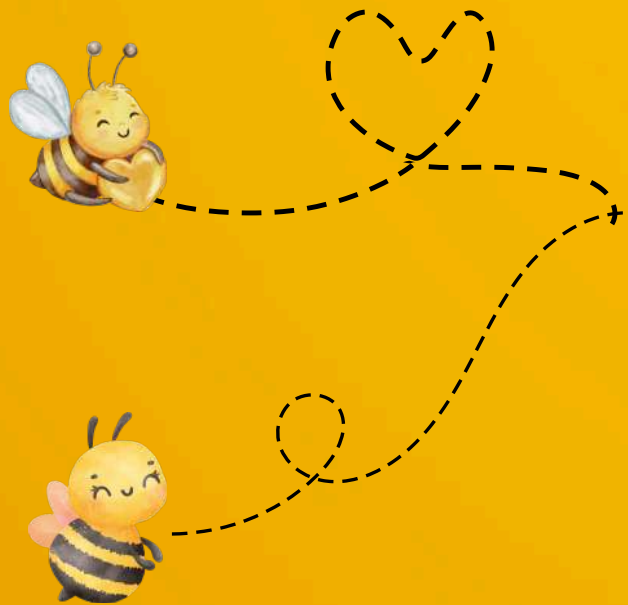
*Integration Bee*







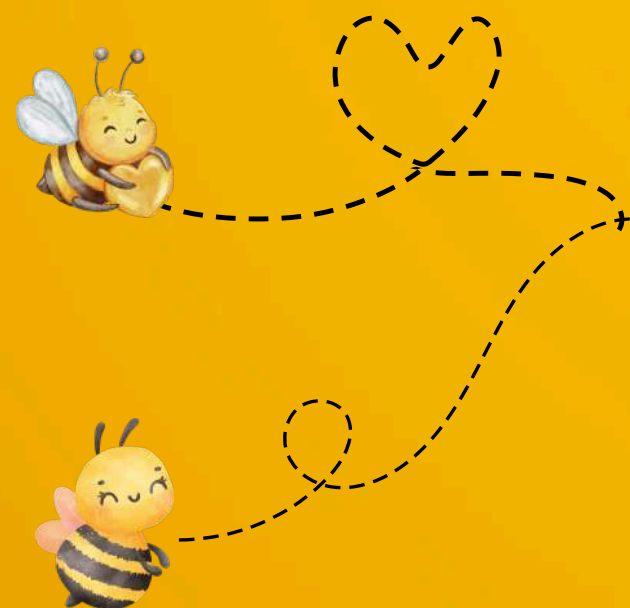
# Safety Slide





# Round of 24

## M7



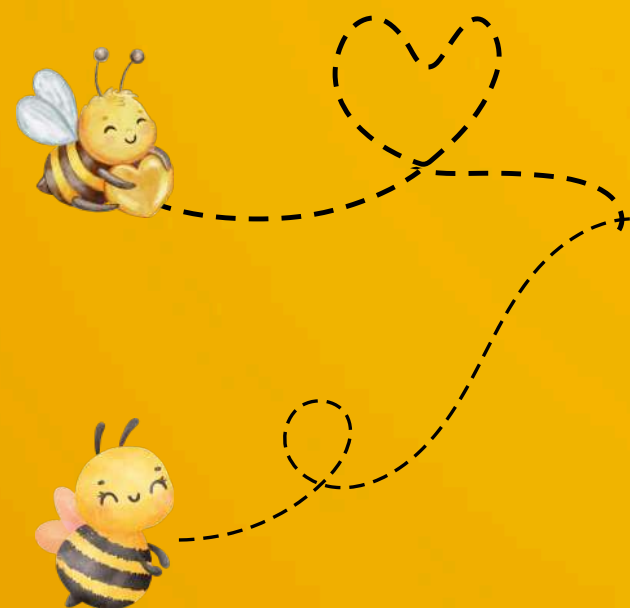
*Integration Bee*



# Round of 24

## Q.7

$$\int_0^\pi \int_0^u \int_0^w \int_0^t \int_0^y \sin(x) \, dx \, dy \, dt \, dw \, du$$

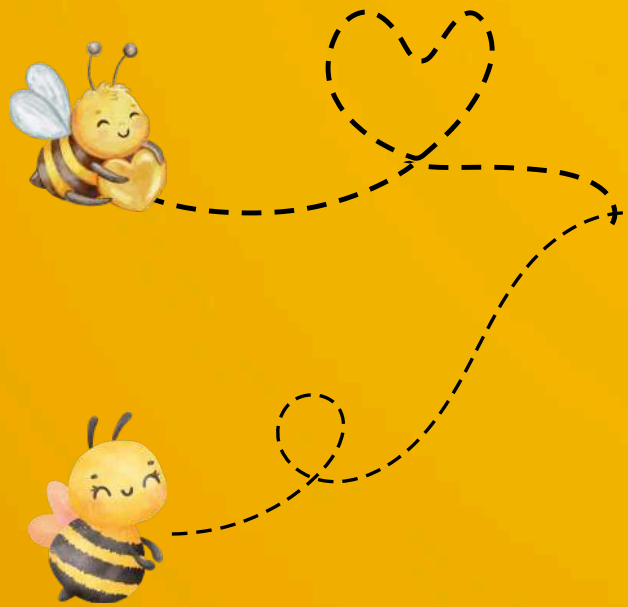


*Integration Bee*





# Safety Slide



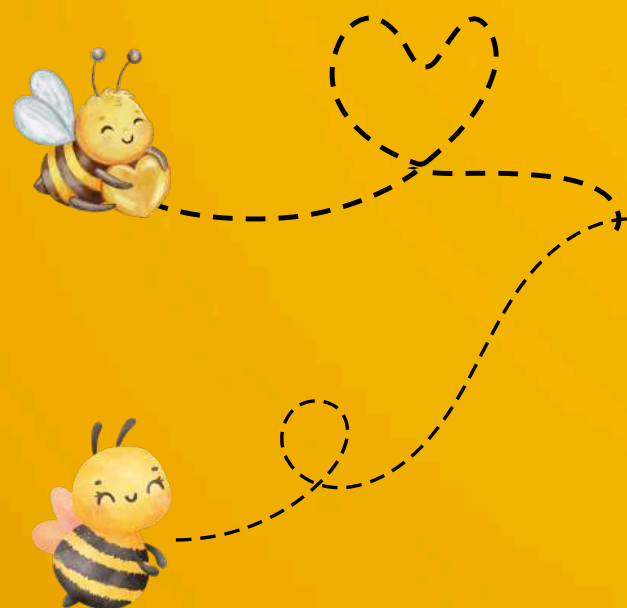


# Round of 24

A.7

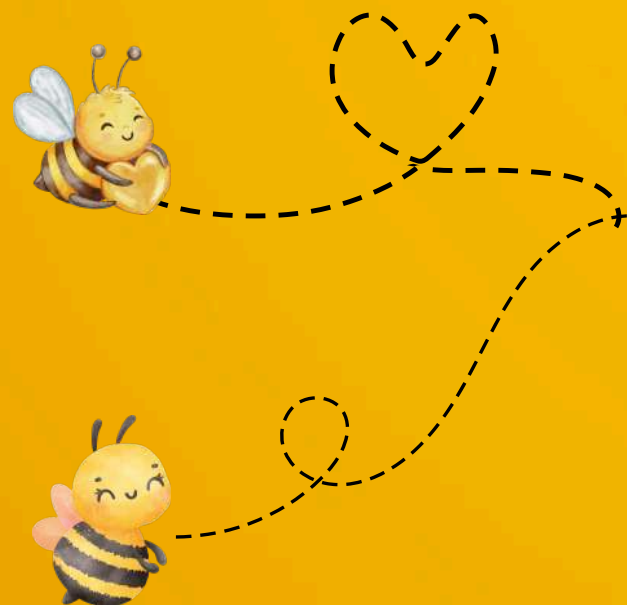
$$2 + \frac{\pi^4}{24} - \frac{\pi^2}{2}$$

*Integration Bee*





# Safety Slide



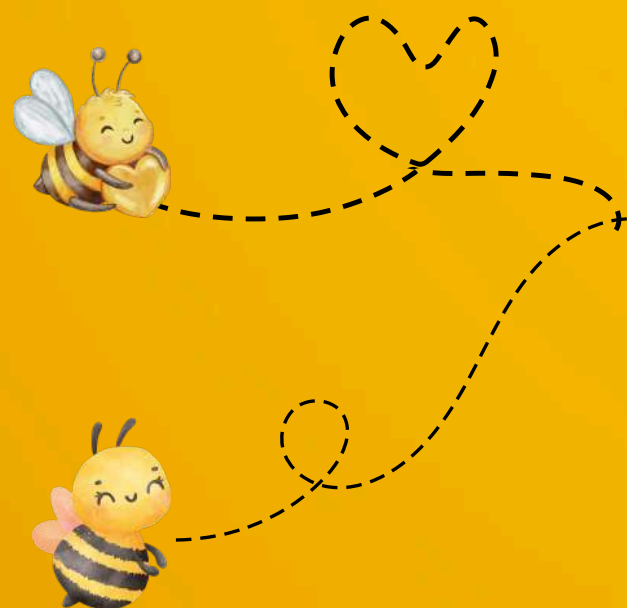




# Round of 24

## M8

*Integration Bee*

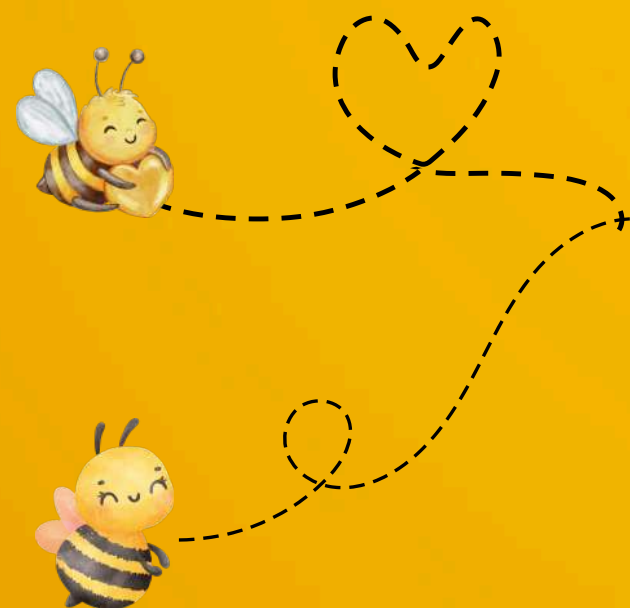




# Round of 24

Q.8

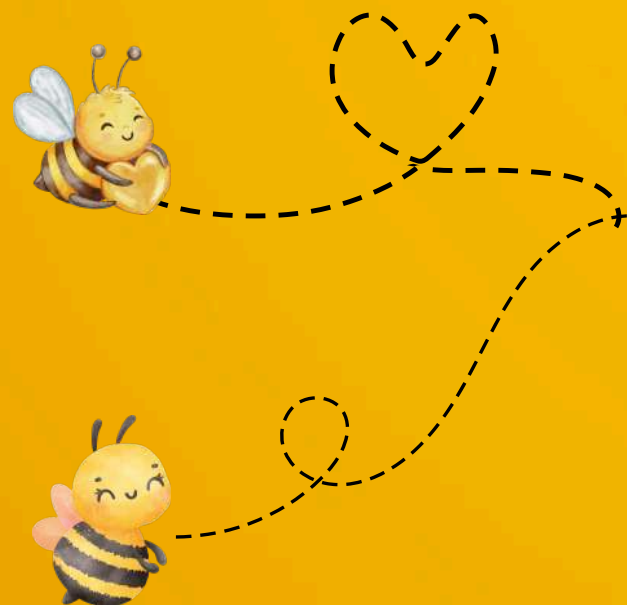
$$\lim_{n \rightarrow \infty} \int_1^{n^2} \frac{dx}{\sqrt{nx} \left[ \sqrt{x} \right]}$$



*Integration Bee*



# Safety Slide





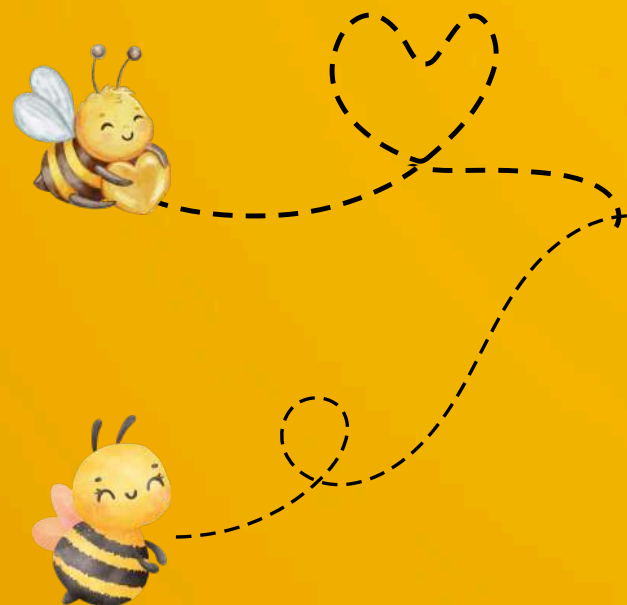


# Round of 24

A.8

4

*Integration Bee*





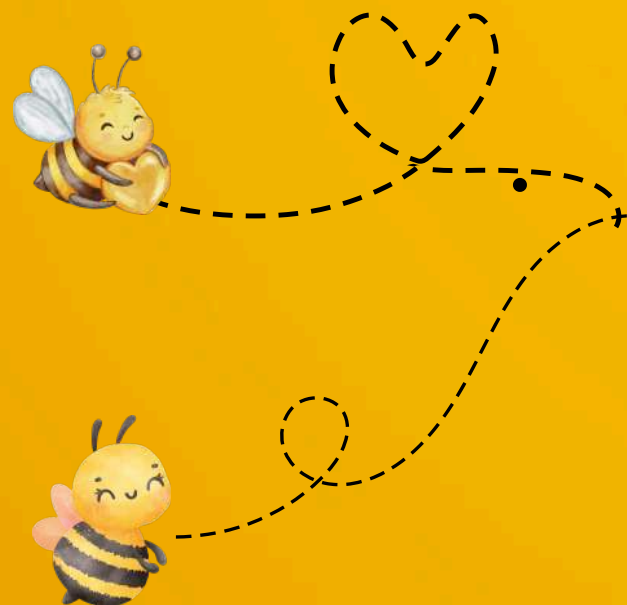
# Safety Slide





## Round of 8

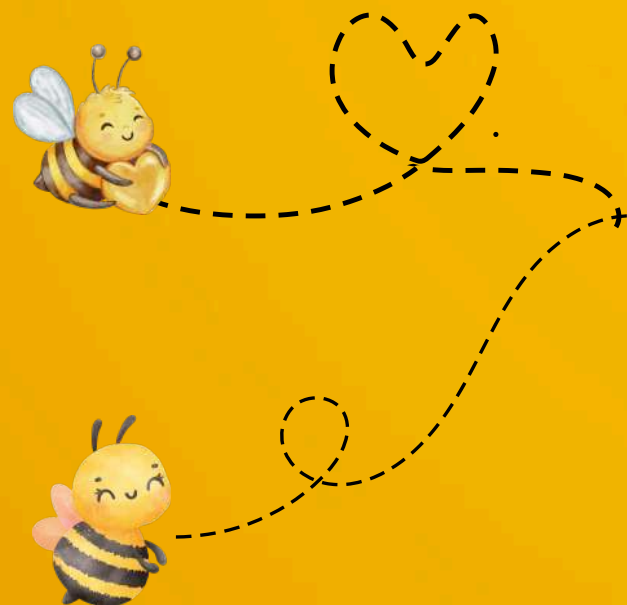
- 8 participants from Round 1 compete in 1-on-1 matches.
- Each match consists of 3 questions.
- The participant who answers the most questions correctly first advances.
- In case of a tie, an additional tiebreaker question will be given.







- You must encircle your final answer before submission.
- Only the answer inside the circle will be considered; calculations will not be checked.
- Once an answer is encircled, no changes can be made.
- If the encircled answer is correct, that participant wins the point.
- If the answer is incorrect, the opponent gets a chance to answer within 3 minutes.
- If both fail to get the correct answer within 3 minutes, no one gets the point.





- If a round ends in a tie, a tiebreaker question will be provided.
- The same rules apply; the participant who solves it correctly first wins.
- If neither gets it right within 3 minutes, the round remains undecided

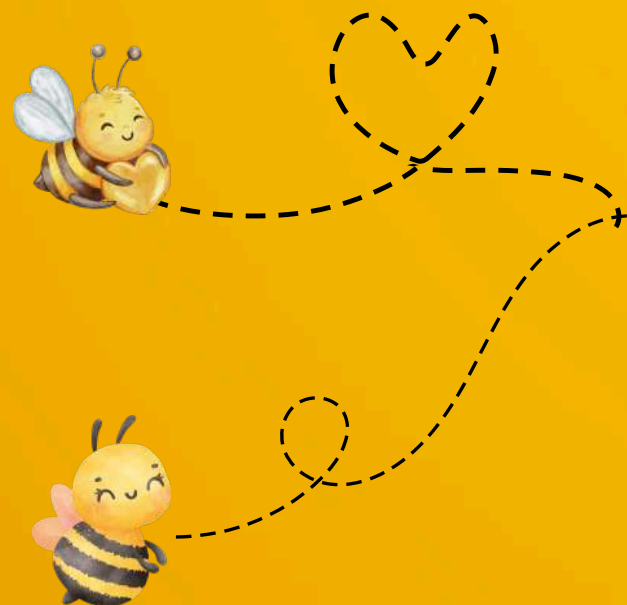




# Round of 8

## M1

*Integration Bee*



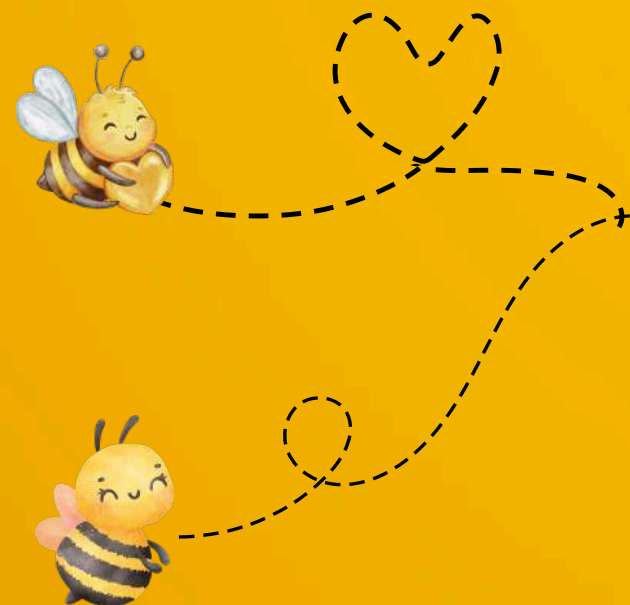




# Round of 8, Match 1

Q.1

$$\int_0^1 \sqrt{x + \sqrt{x + \sqrt{x + \sqrt{\dots}}}} dx$$



*Integration Bee*



# Safety Slide

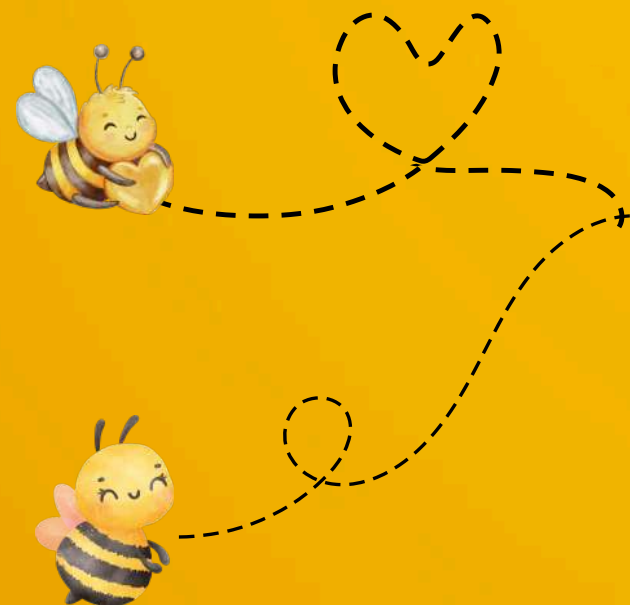




# Round of 8, Match 1

A.1

$$\frac{5}{12} \left( 1 + \sqrt{5} \right)$$

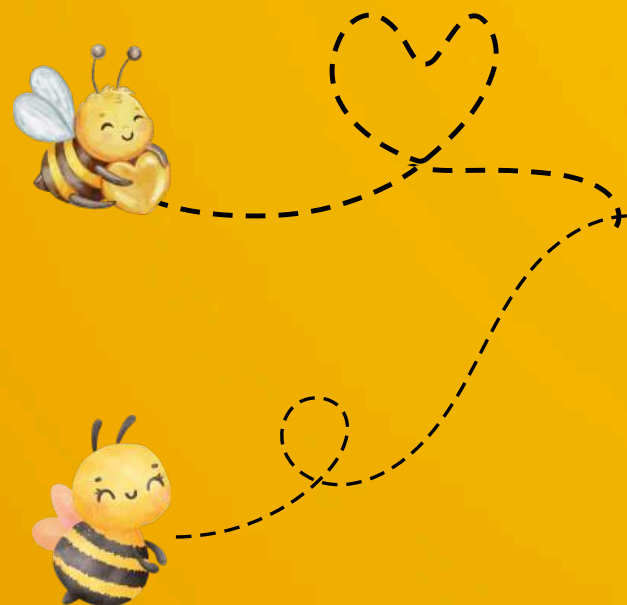


*Integration Bee*





# Safety Slide

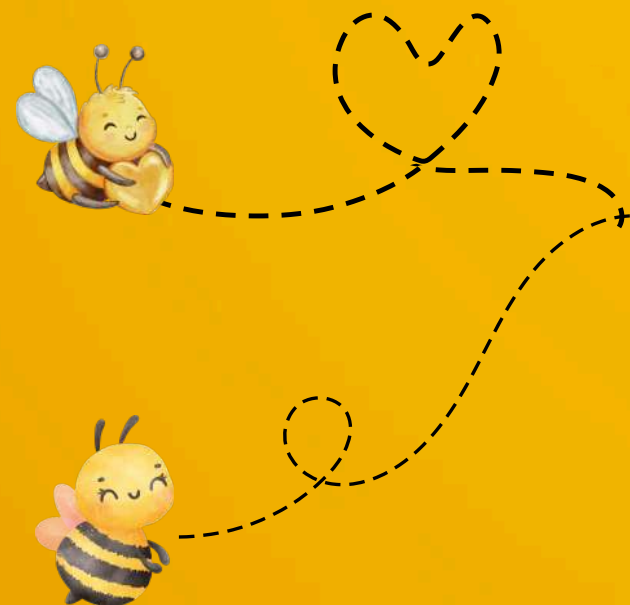




# Round of 8, Match 1

Q.2

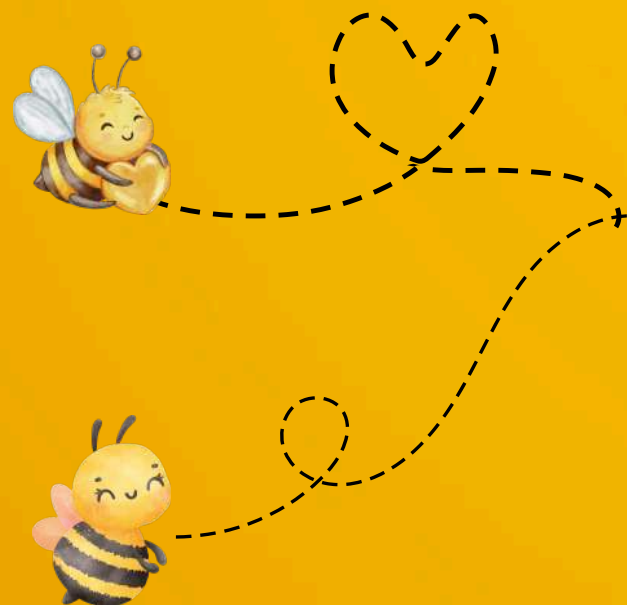
$$\int_e^{e^2} \sqrt{x} \ln(x) \sqrt{\ln(x) - 1} \, dx$$



*Integration Bee*



# Safety Slide





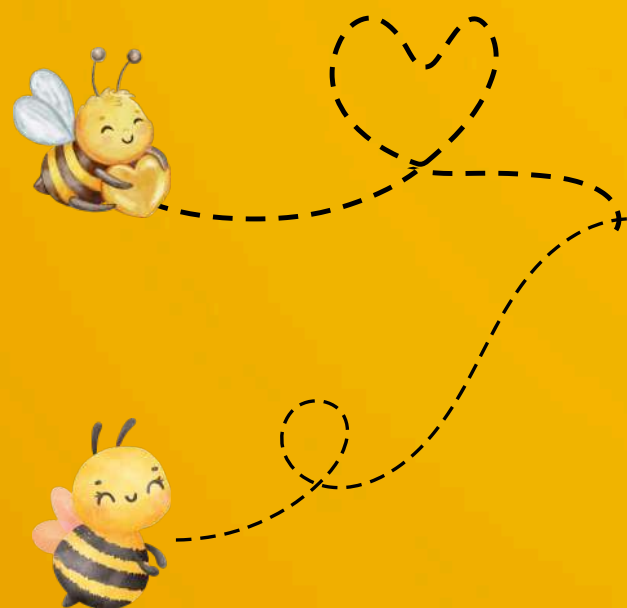


# Round of 8, Match 1

A.2

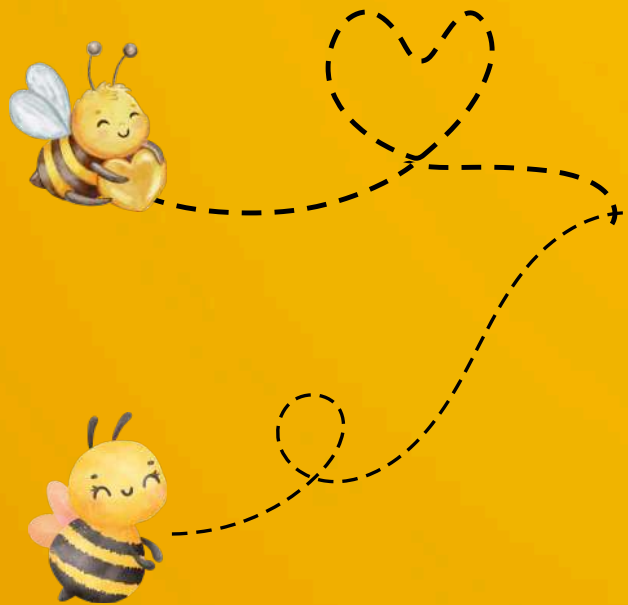
$$\frac{2e^3}{3}$$

*Integration Bee*





# Safety Slide

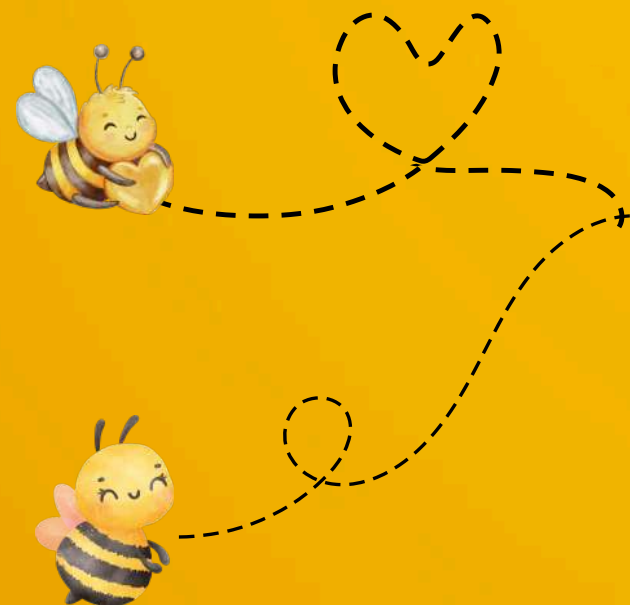




# Round of 8, Match 1

## Q.3

$$\int_1^4 \sqrt[3]{x + \frac{x+8}{3}} \sqrt{\frac{x-1}{3}} + \sqrt[3]{x - \frac{x+8}{3}} \sqrt{\frac{x-1}{3}} dx$$

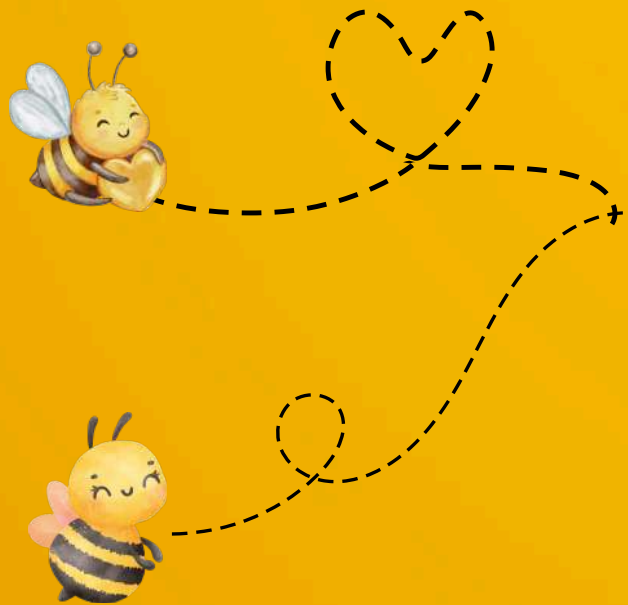


*Integration Bee*





# Safety Slide



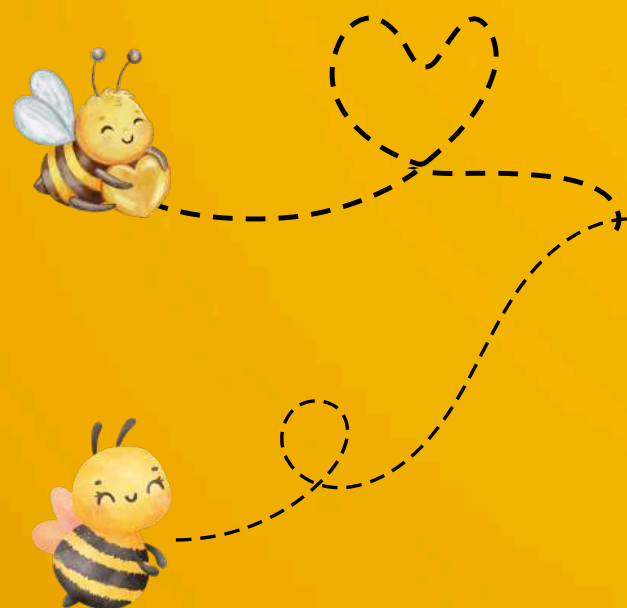


# Round of 8, Match 1

A.3

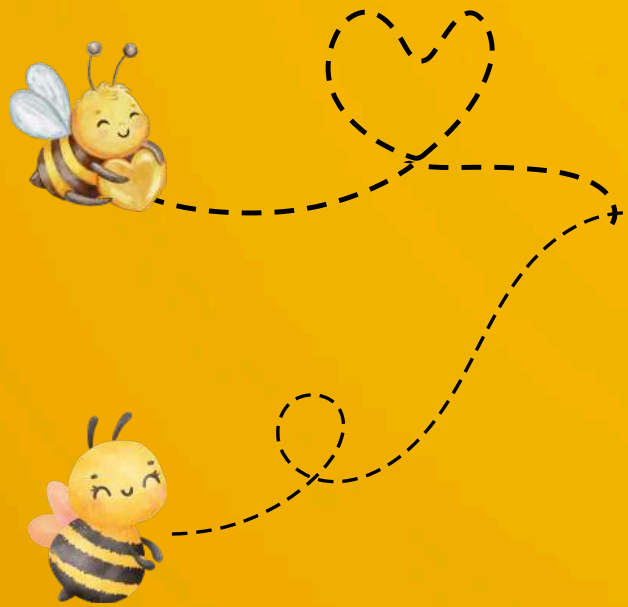
6

*Integration Bee*





# Safety Slide



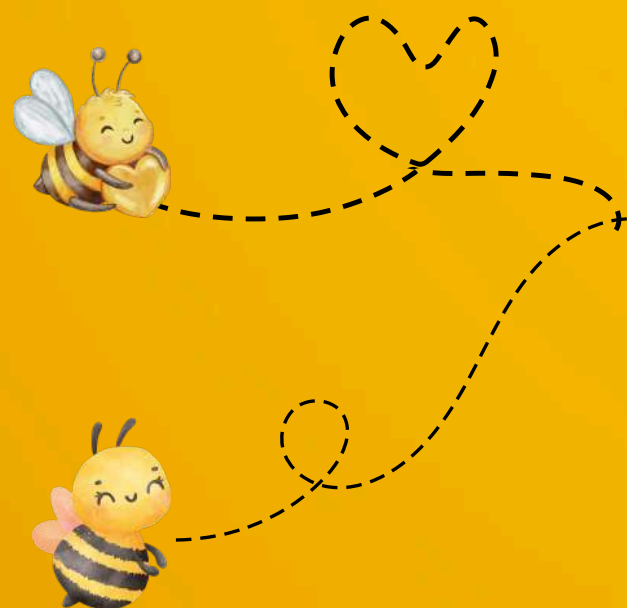




# Round of 8

## M2

*Integration Bee*

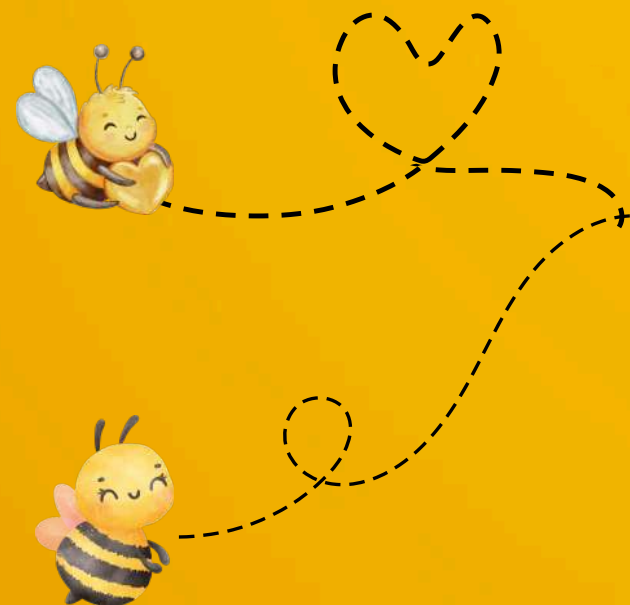




# Round of 8, Match 2

Q.1

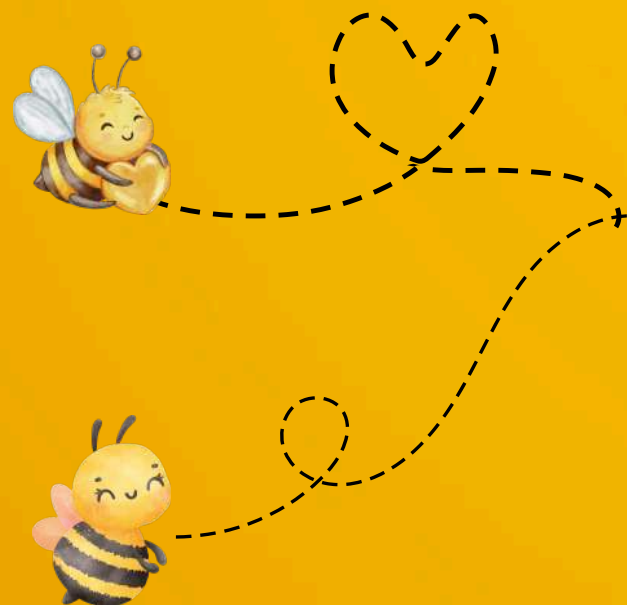
$$\int_0^{\infty} \cos(3x) e^{\frac{-x^2}{2}} dx$$



*Integration Bee*



# Safety Slide





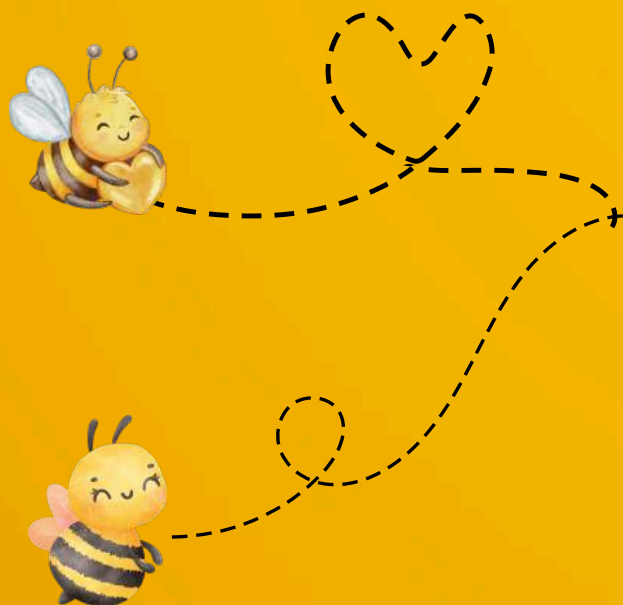


# Round of 8, Match 2

## A.1

$$\sqrt{\frac{\pi}{2e^9}}$$

*Integration Bee*





# Safety Slide



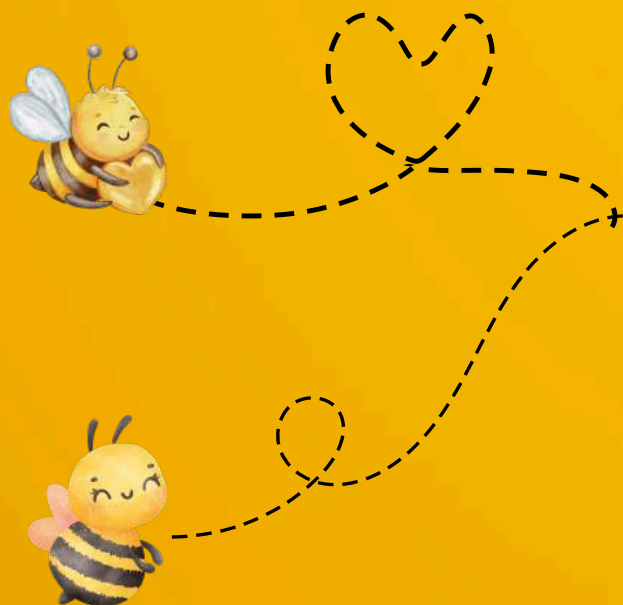


# Round of 8, Match 2

Q.2

$$\int_0^9 \frac{1}{\sqrt{1 + \sqrt{x}}} dx$$

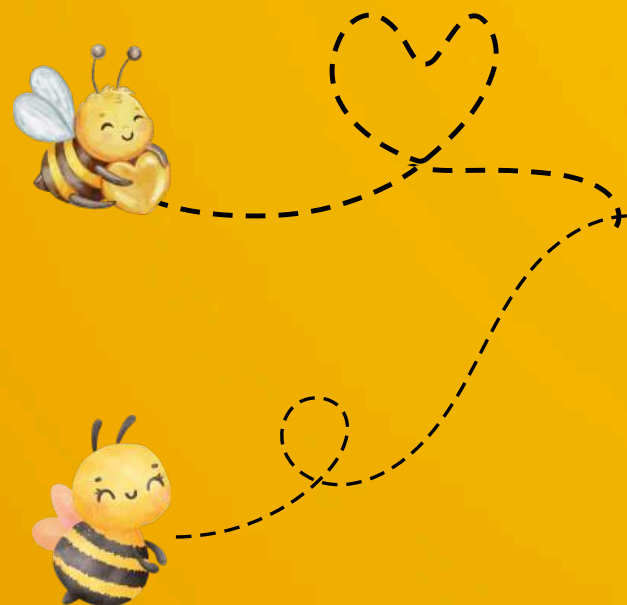
*Integration Bee*







# Safety Slide



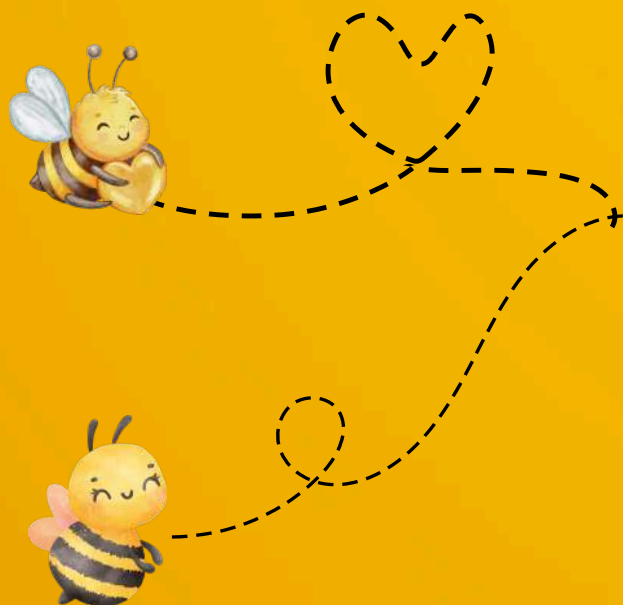


# Round of 8, Match 2

A.2

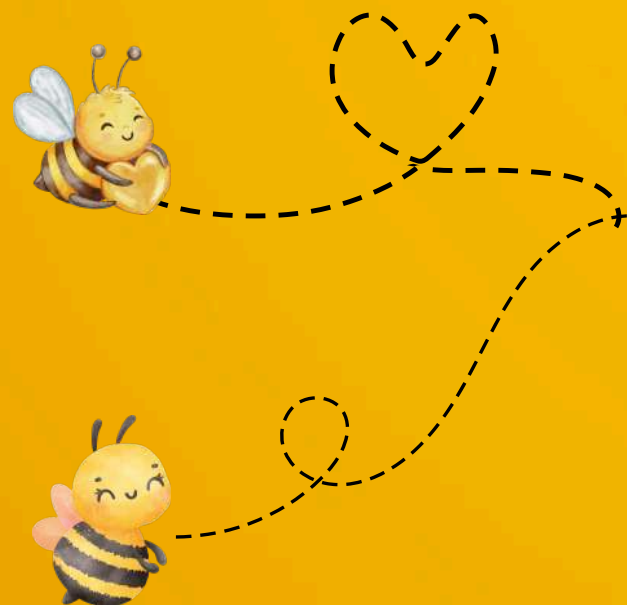
$$\frac{16}{3}$$

*Integration Bee*





# Safety Slide



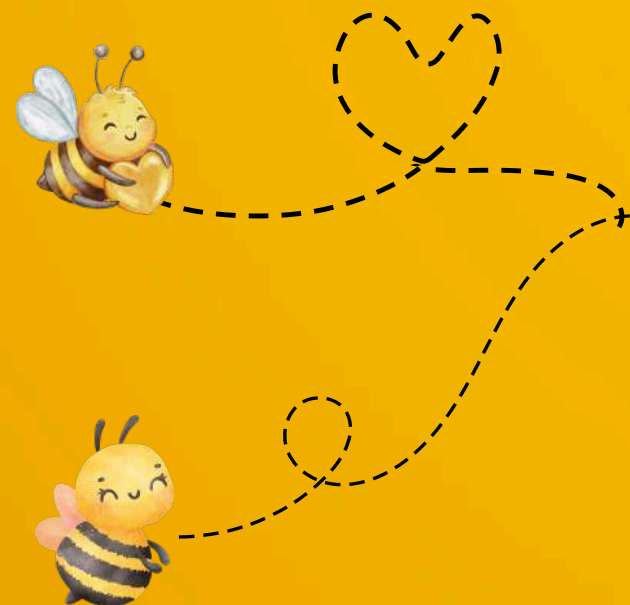




# Round of 8, Match 2

## Q.3

$$\lim_{n \rightarrow 0^-} \frac{1}{n} \int_0^1 \left( x^{n \ln^5(x)} - 1 \right) dx$$



*Integration Bee*



# Safety Slide



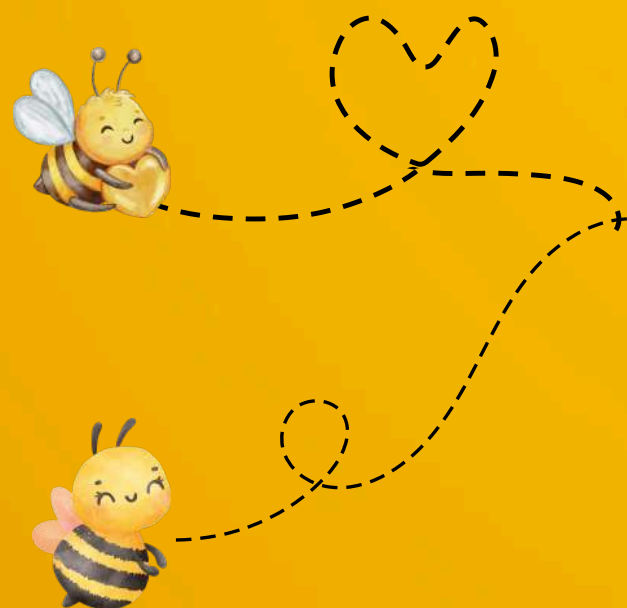


# Round of 8, Match 2

A.3

720

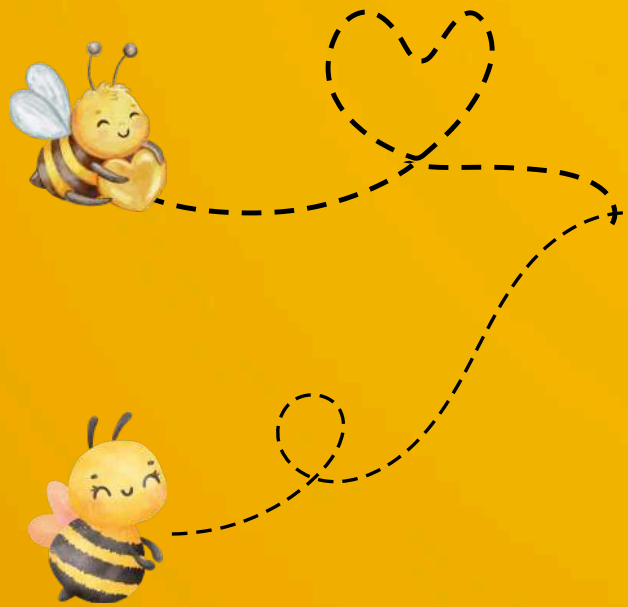
*Integration Bee*







# Safety Slide

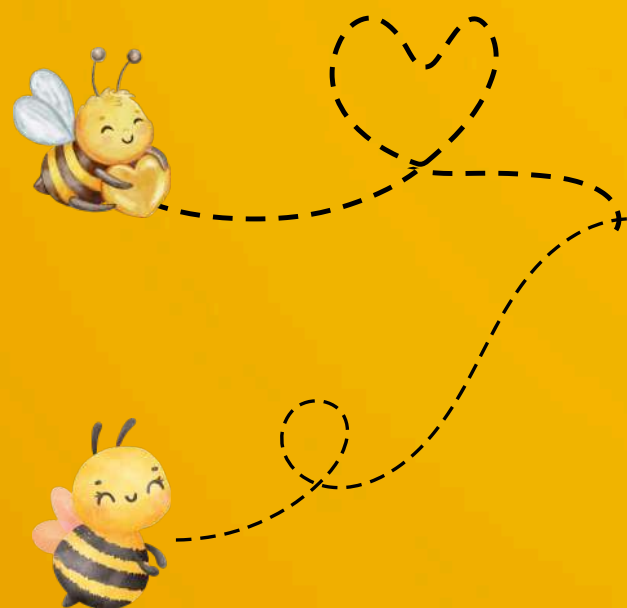




# Round of 8

## M3

*Integration Bee*

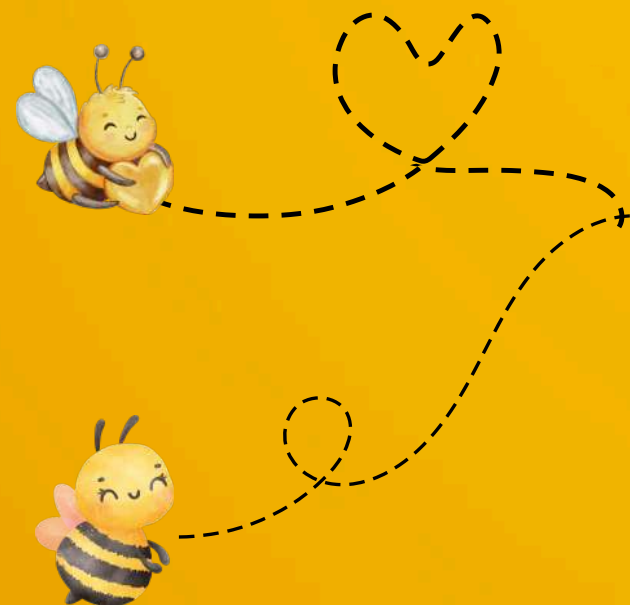




# Round of 8, Match 3

Q.1

$$\int_0^{\frac{\pi}{4}} (\sin x) \ln(\sin x) dx$$

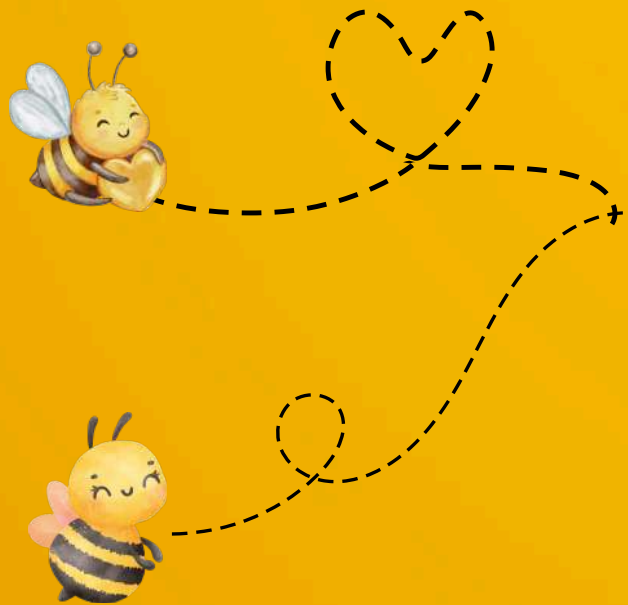


*Integration Bee*





# Safety Slide

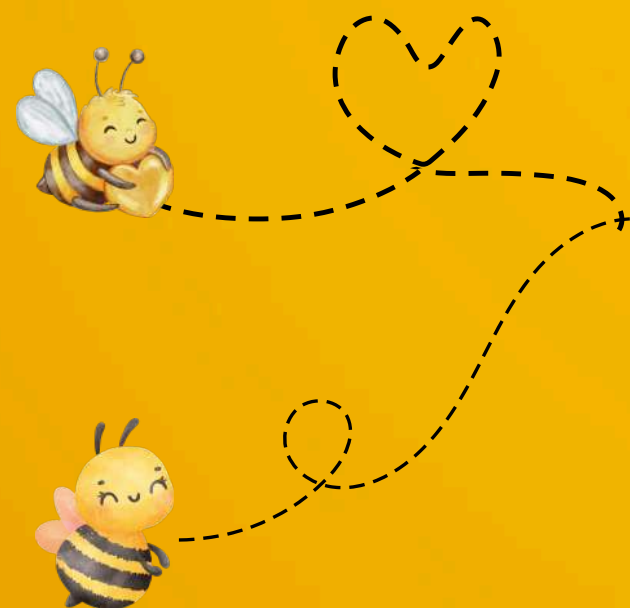




# Round of 8, Match 3

A.1

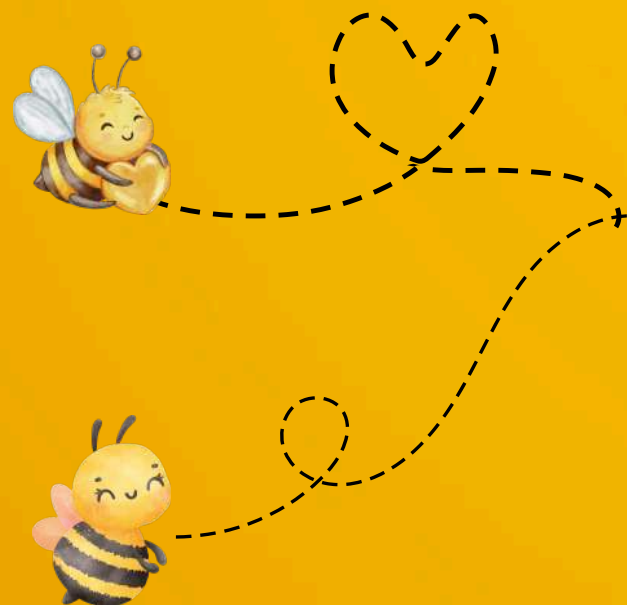
$$\ln 2 - 1$$



*Integration Bee*



# Safety Slide



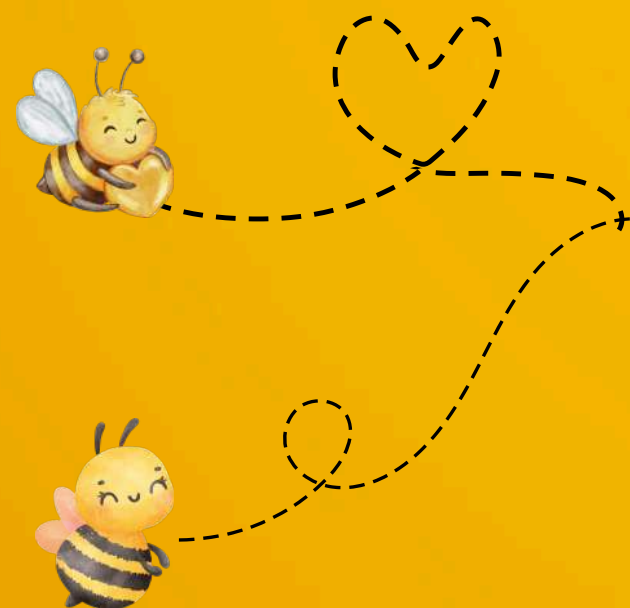




# Round of 8, Match 3

## Q.2

$$\int_0^{\infty} \frac{\tan^{-1}(3x) - \tan^{-1}(2x)}{x} dx$$



*Integration Bee*



# Safety Slide



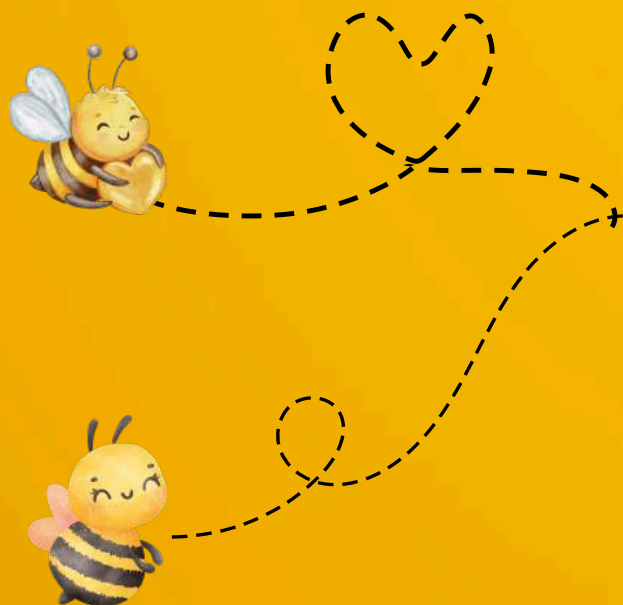


# Round of 8, Match 3

## A.2

$$\frac{\pi}{2} \ln \left( \frac{3}{2} \right)$$

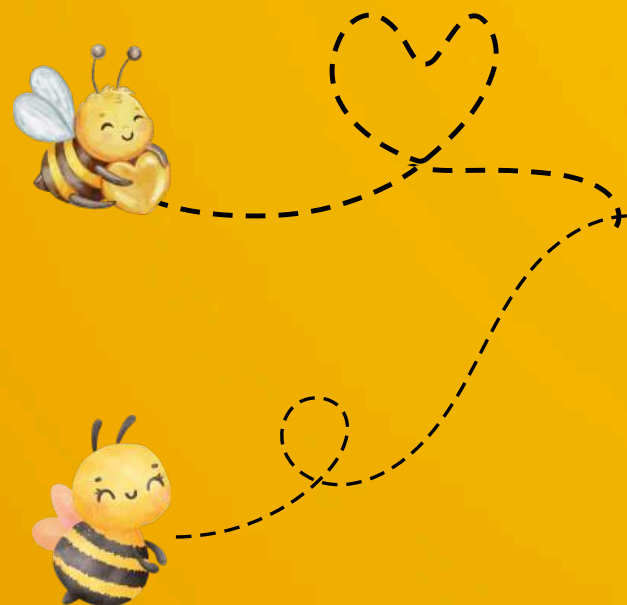
*Integration Bee*







# Safety Slide

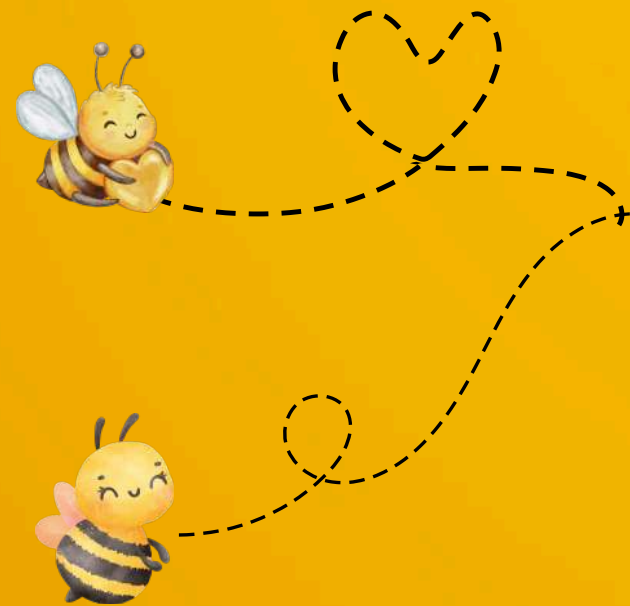




# Round of 8, Match 3

Q.3

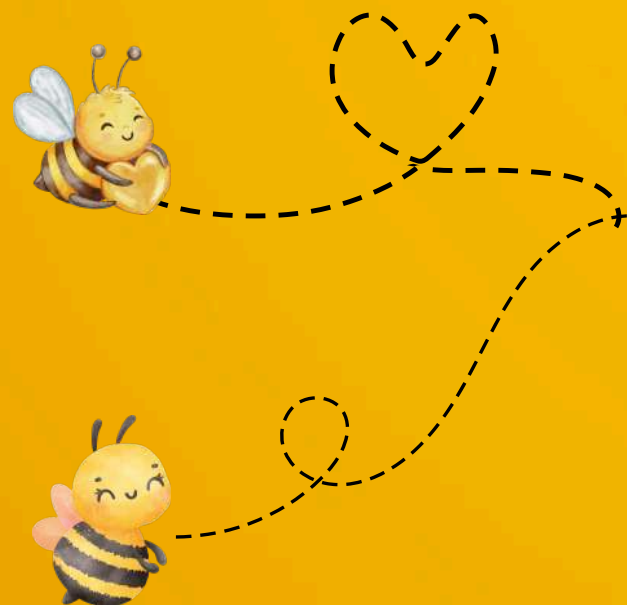
$$\int \frac{\tan^4(1 + (\ln x)^2) \ln x}{x} dx$$



*Integration Bee*



# Safety Slide



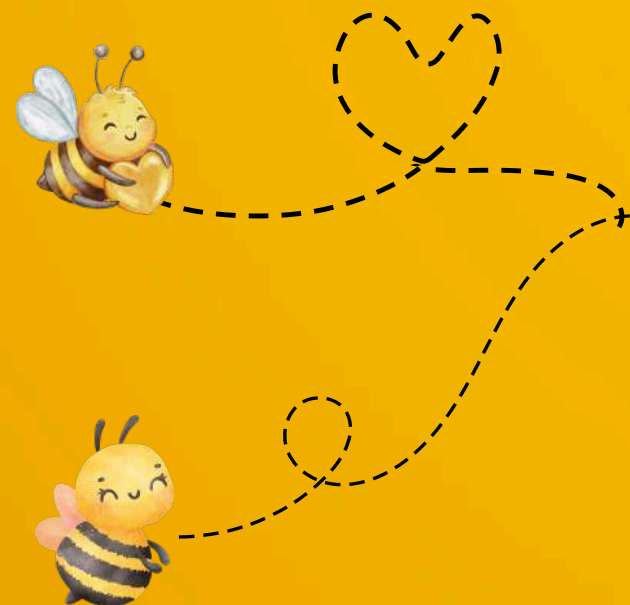




# Round of 8, Match 3

## A.3

$$\frac{1}{2} \left( \frac{\tan^3(1 + (\ln x)^2)}{3} - \tan(1 + (\ln x)^2) + 1 + (\ln x)^2 \right) + C$$



*Integration Bee*



# Safety Slide

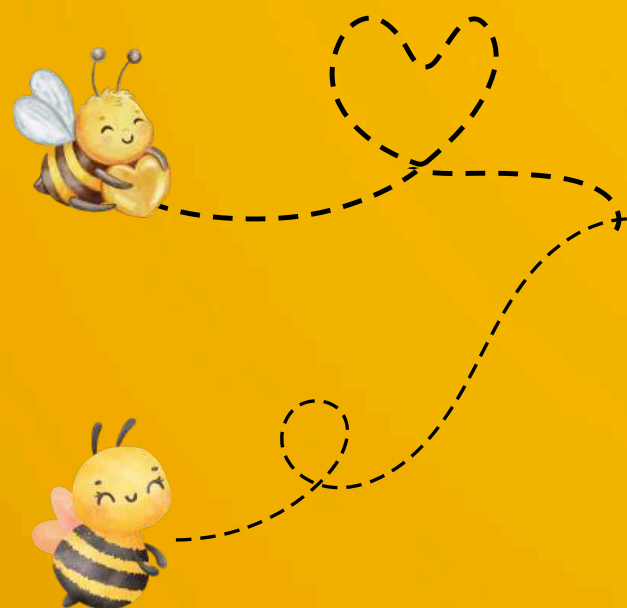




# Round of 8

## M4

*Integration Bee*





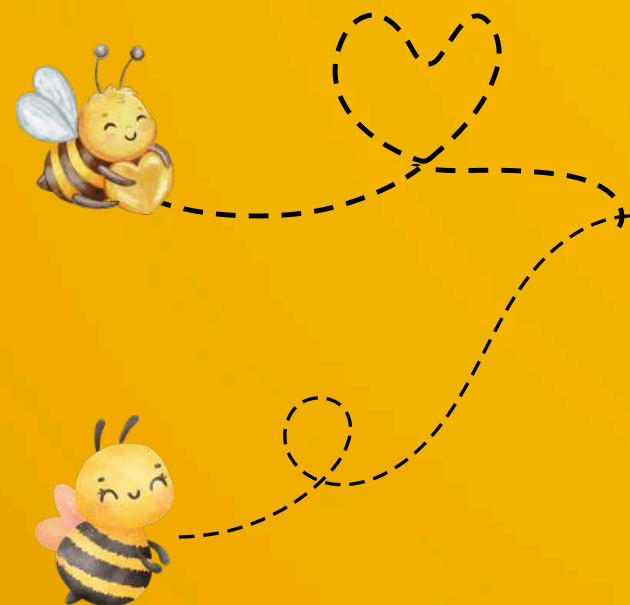


# Round of 8, Match 4

## Q.1

Let  $f(x) = \ln x + \tan^{-1} x$ . Compute

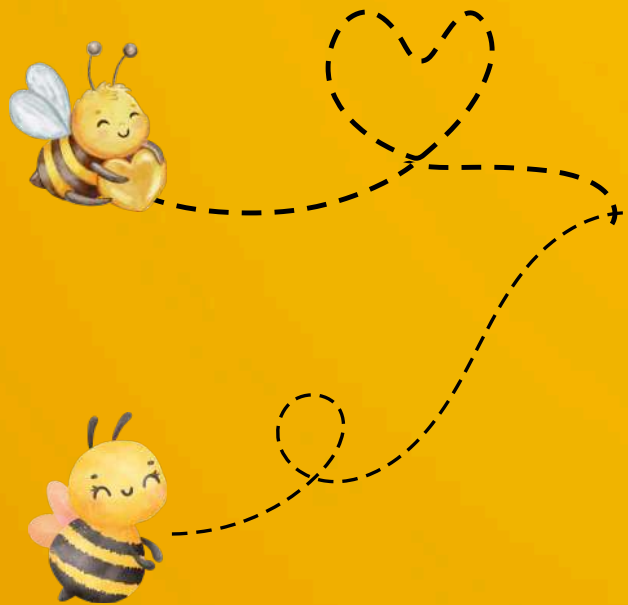
$$\int_{\frac{\pi}{4}}^{\frac{1}{2}\ln 3 + \frac{\pi}{3}} f^{-1}(x) dx$$



*Integration Bee*



# Safety Slide

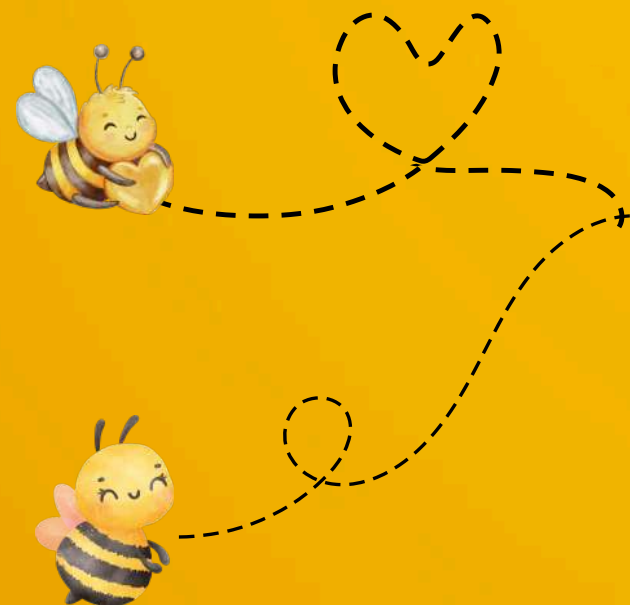




# Round of 8, Match 4

A.1

$$\sqrt{3} - 1 + \ln 2$$

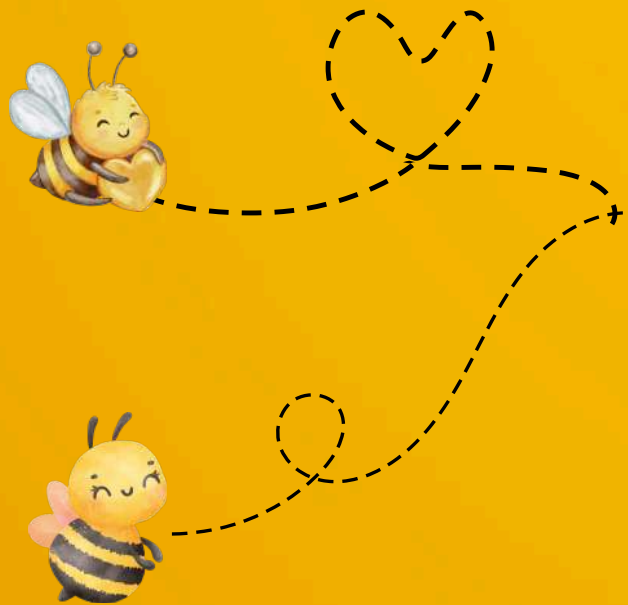


*Integration Bee*





# Safety Slide

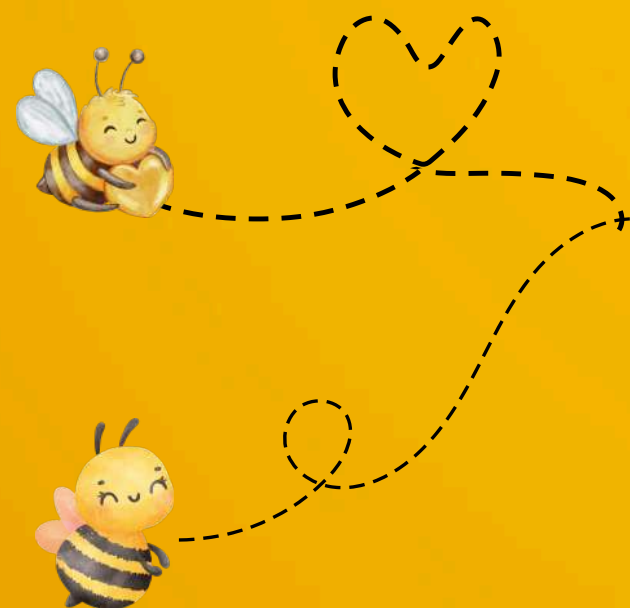




# Round of 8, Match 4

## Q.2

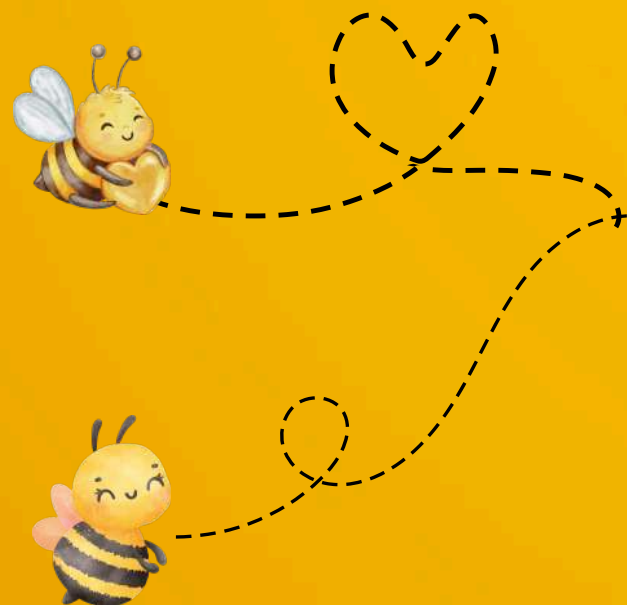
$$\lim_{n \rightarrow \infty} \left( \frac{(n^2 + 1)(n^2 + 2^2)(n^2 + 3^2) \cdots (n^2 + n^2)}{n^{2n}} \right)^{\frac{1}{n}}$$



*Integration Bee*



# Safety Slide



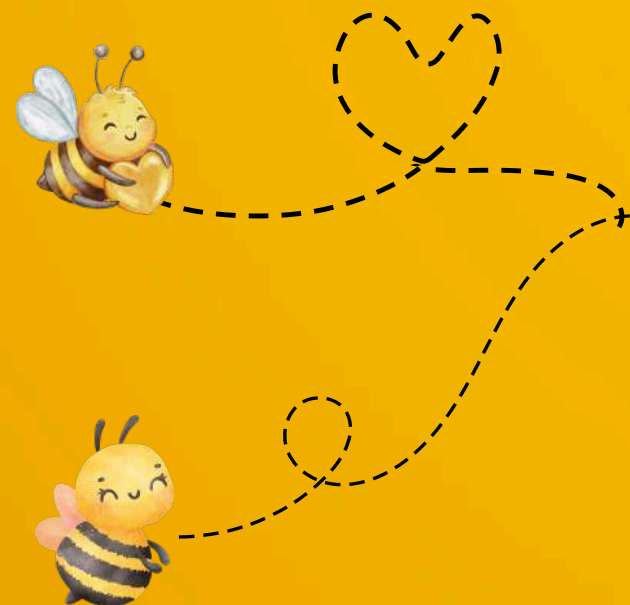




# Round of 8, Match 4

A.2

$$e^{\ln 2 - 2\left(1 - \frac{\pi}{4}\right)}$$



*Integration Bee*



# Safety Slide



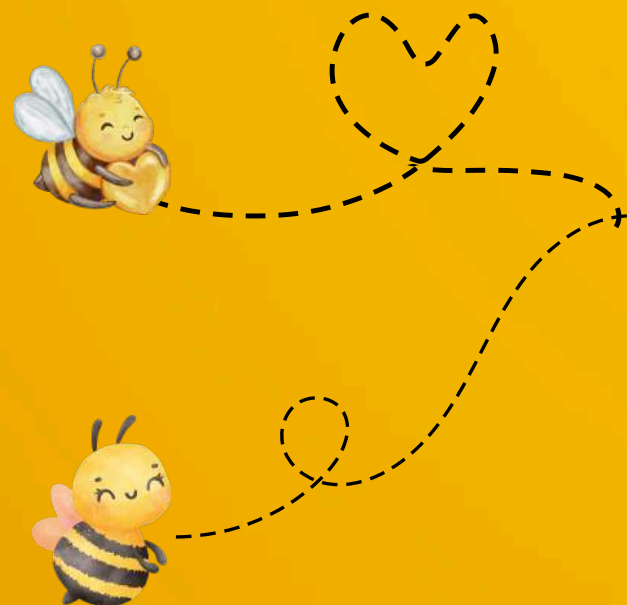


# Round of 8, Match 4

Q.3

$$\int_{-3}^1 \frac{3^x \sqrt{x+3} (x+2)}{\sqrt{x+3}} dx$$

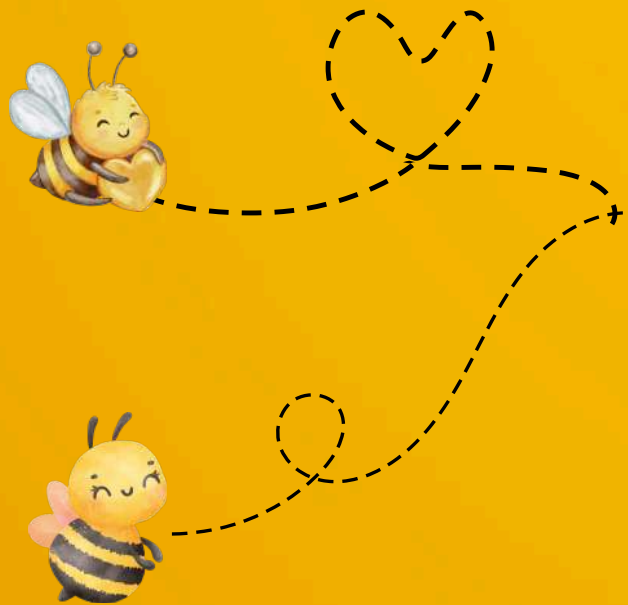
*Integration Bee*







# Safety Slide



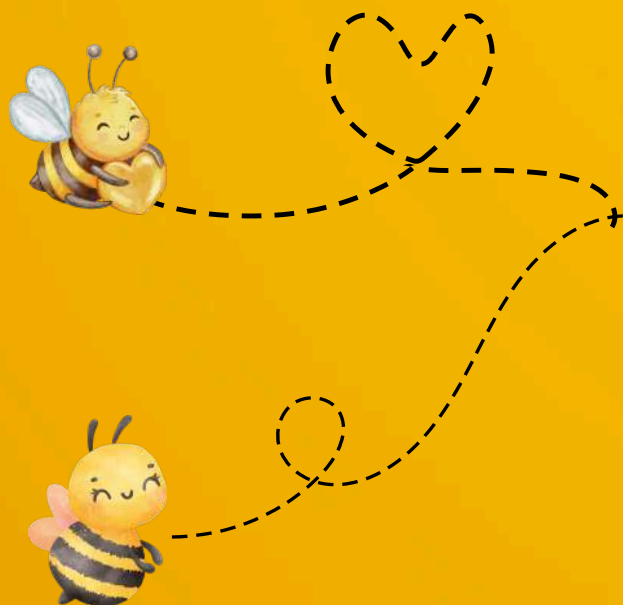


# Round of 8, Match 4

A.3

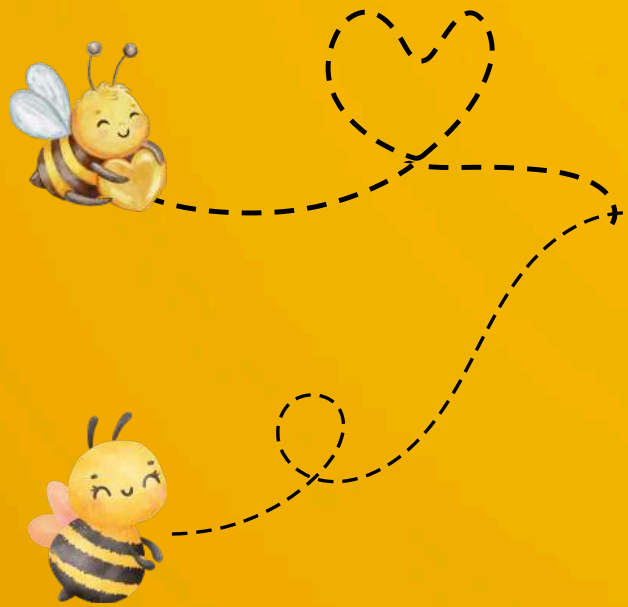
$$\frac{16}{3\ln 3}$$

*Integration Bee*





# Safety Slide

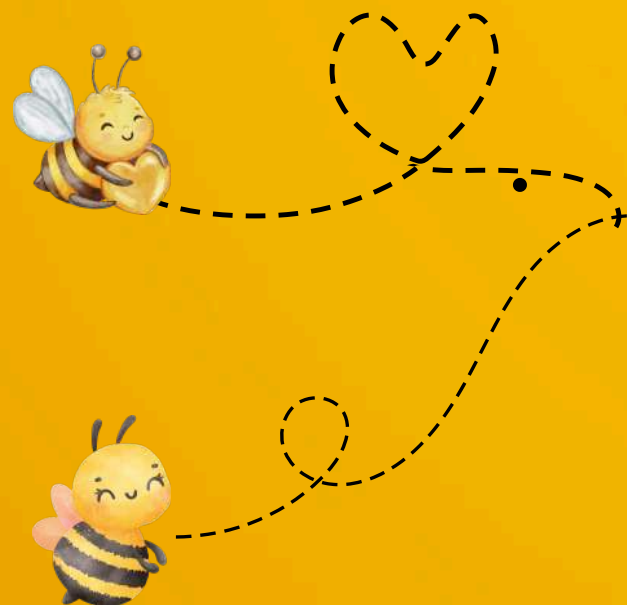






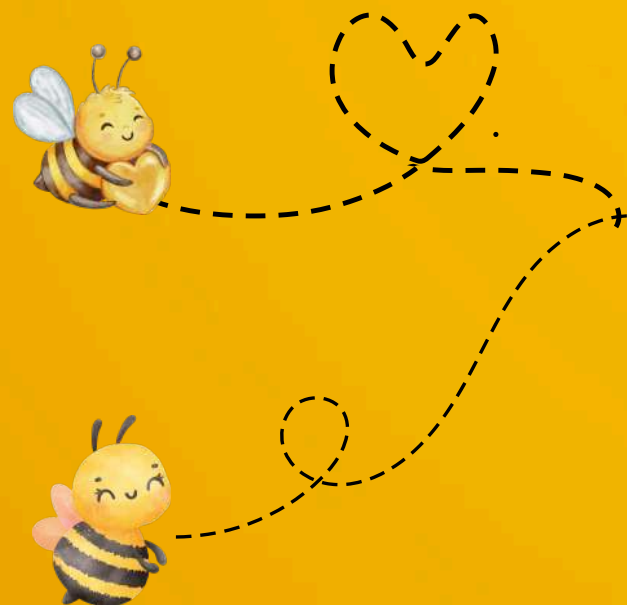
# Semi-Finals

- 4 participants from Round 2 compete in 1-on-1 matches. 2 participants will advance to the finals.
- Each match consists of 3 questions.
- The participant who answers the most questions correctly first advances.
- In case of a tie, an additional tiebreaker question will be given.



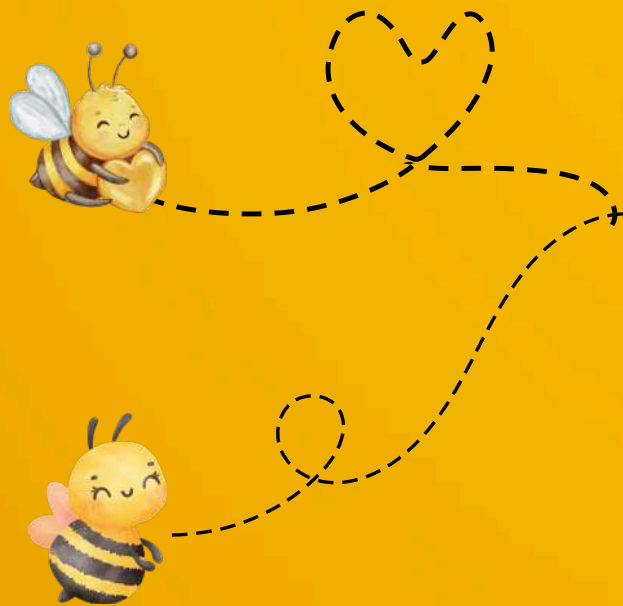


- You must encircle your final answer before submission.
- Only the answer inside the circle will be considered; calculations will not be checked.
- Once an answer is encircled, no changes can be made.
- If the encircled answer is correct, that participant wins the point.
- If the answer is incorrect, the opponent gets a chance to answer within 3 minutes.
- If both fail to get the correct answer within 3 minutes, no one gets the point.





- If a round ends in a tie, a tiebreaker question will be provided.
- The same rules apply; the participant who solves it correctly first wins.
- If neither gets it right within 3 minutes, the round remains undecided

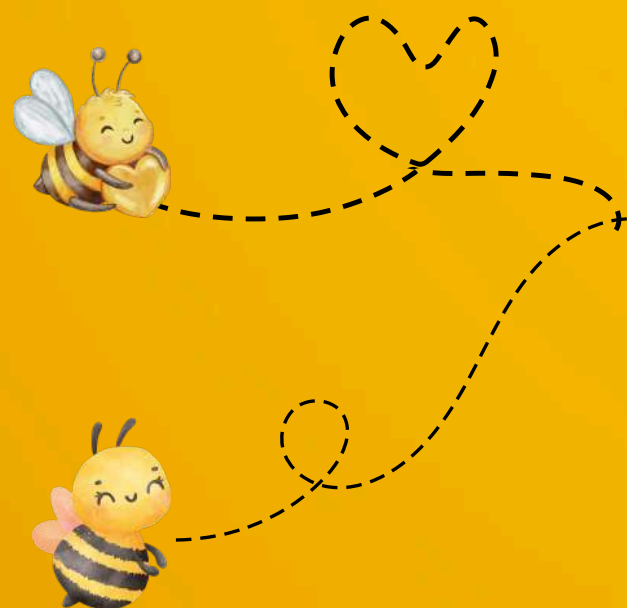






# SEMI FINAL 1

*Integration Bee*





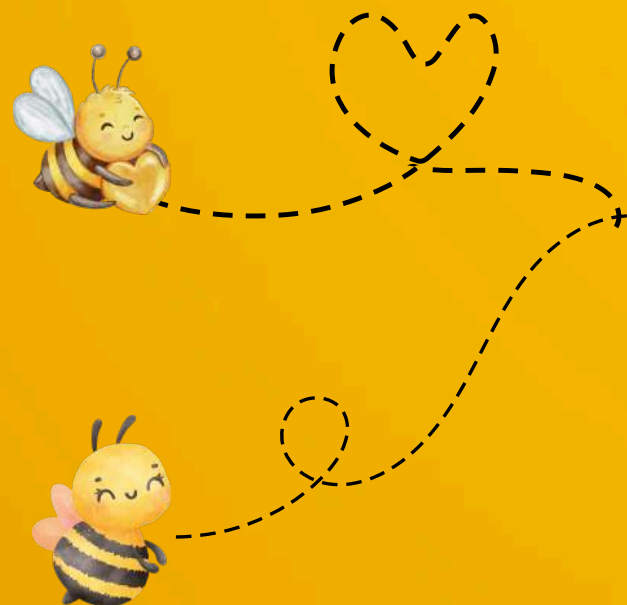
# Semi-final, Match 1

## Q.1

Let  $f(x) = \frac{x}{\sqrt[4]{x^4 + 1}}$ . Compute

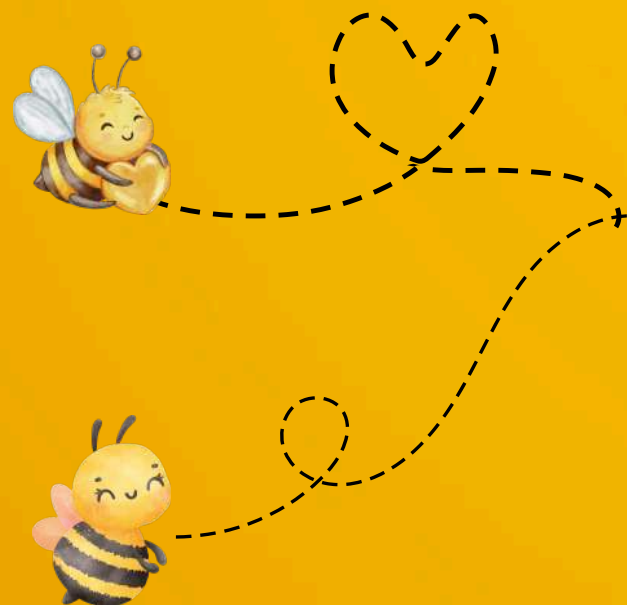
$$\int x^2 f(f(f(f(x)))) \, dx$$

*Integration Bee*





# Safety Slide





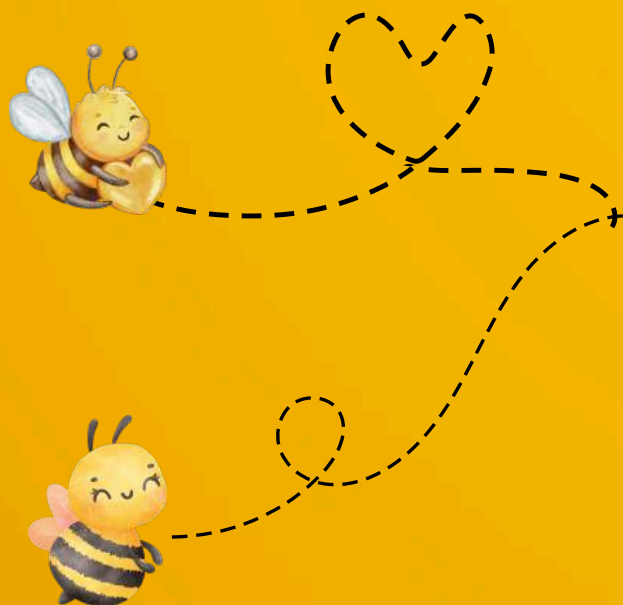


# Semi-final, Match 1

## A.1

$$\frac{(4x^4 + 1)^{\frac{3}{4}}}{12} + C$$

*Integration Bee*





# Safety Slide





# Semi-final, Match 1

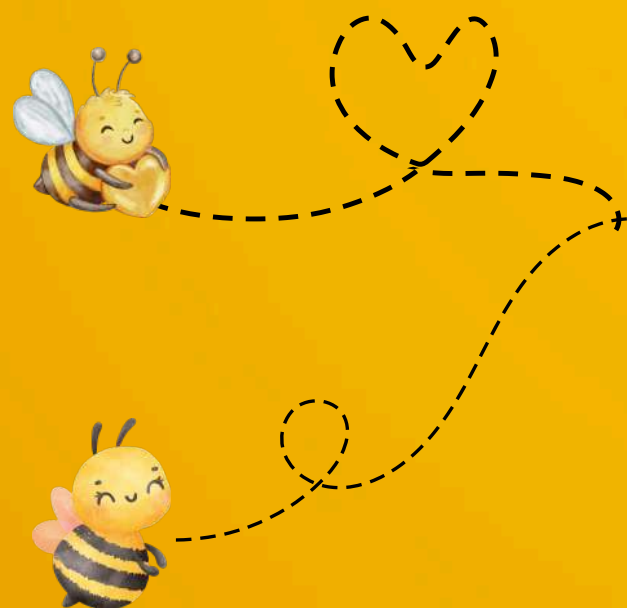
## Q.2

Let  $I(z)$  be defined as

$$I(z) = \frac{1}{(n-1)!} \int_0^\infty \frac{x^{n-1} dx}{z^{-1}e^x - 1}$$

where  $n$  is a natural number. Find  $\frac{d^3 I}{dz^3}$  at  $z = 0$ .

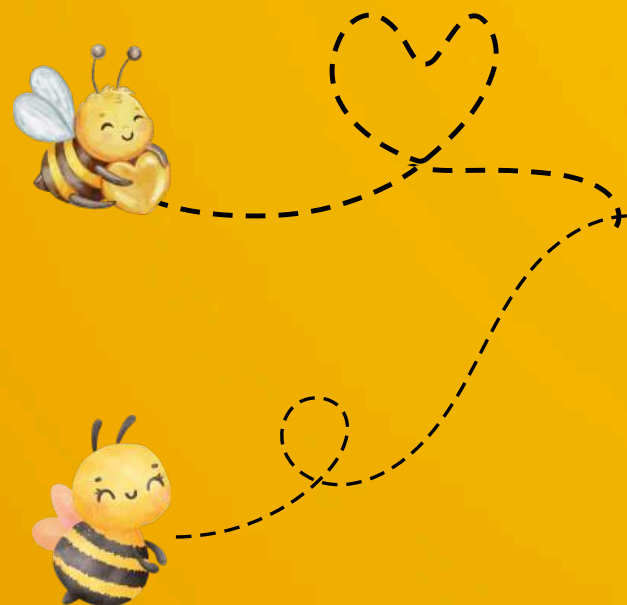
*Integration Bee*







# Safety Slide



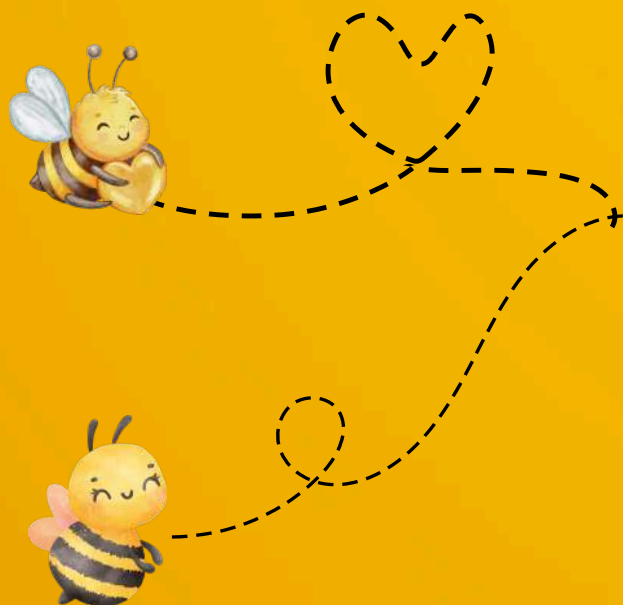


# Semi-final, Match 1

A.2

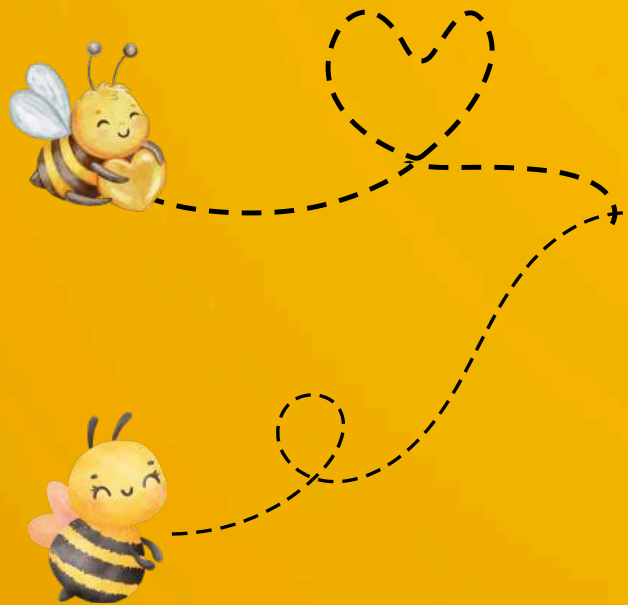
$$\frac{3!}{3^n}$$

*Integration Bee*





# Safety Slide



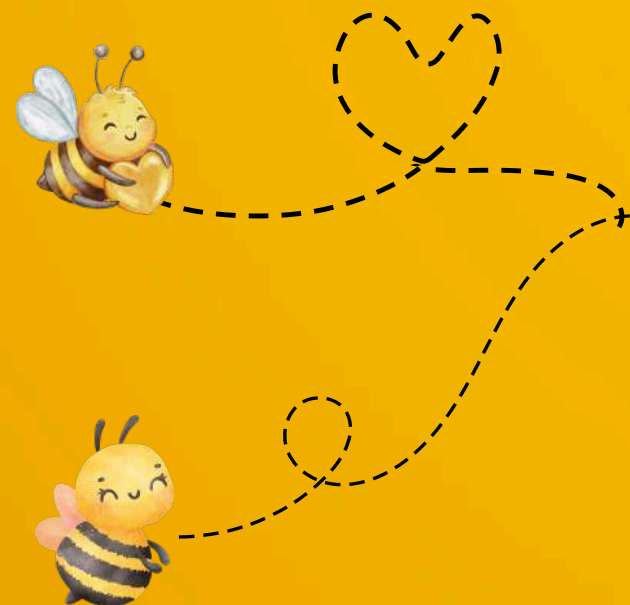




# Semi-final, Match 1

## Q.3

$$\int_0^{\frac{\pi}{8}} \sum_{n=1}^{\infty} \sin \left( \frac{x}{2^{n-1}} \right) \sin \left( \frac{3x}{2^{n-1}} \right) dx$$



*Integration Bee*



# Safety Slide



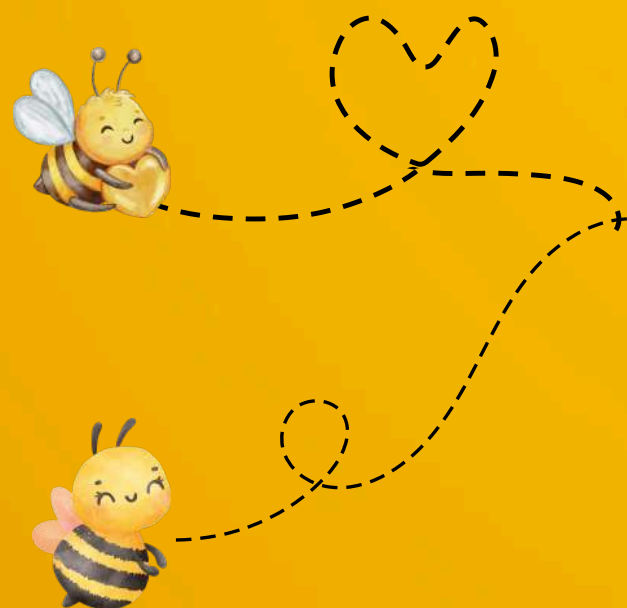


# Semi-final, Match 1

A.3

$$\frac{\pi - 2}{16}$$

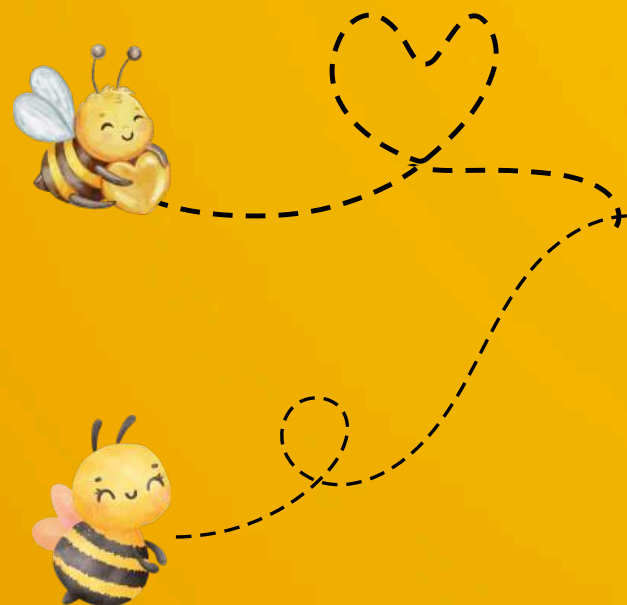
*Integration Bee*







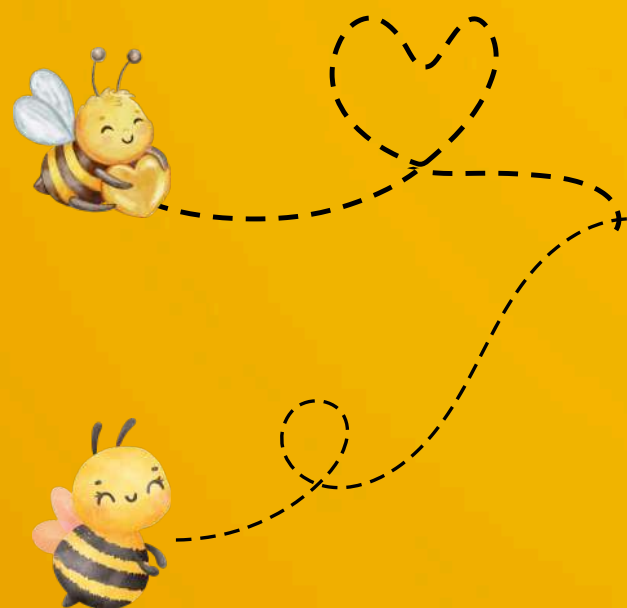
# Safety Slide





# SEMI FINAL 2

*Integration Bee*

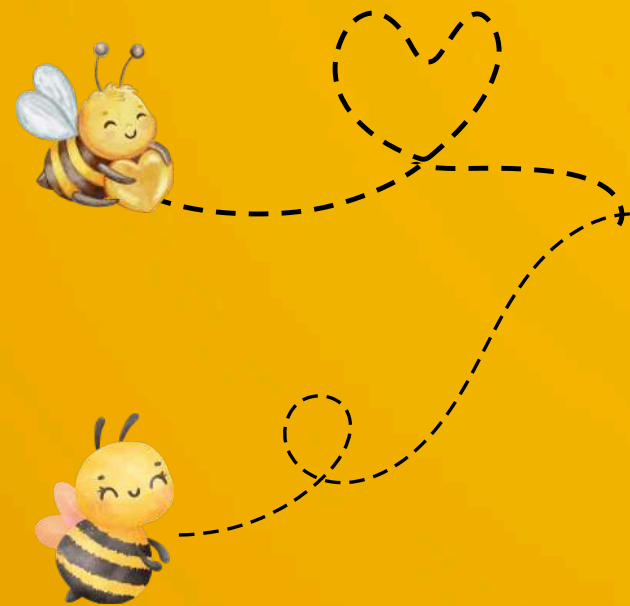




# Semi-final, Match 2

Q.1

$$\int x^{\ln\left(\ln\left(x^{\frac{1}{e}}\right)\right)} (1 + \ln(\ln(x))) dx$$

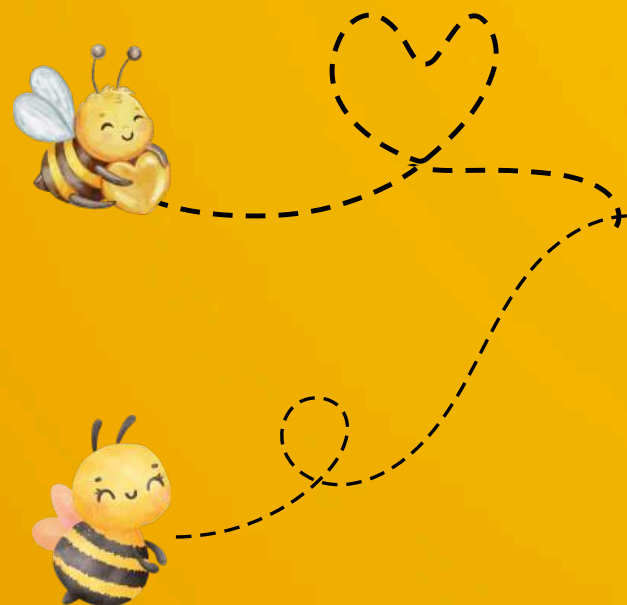


*Integration Bee*





# Safety Slide

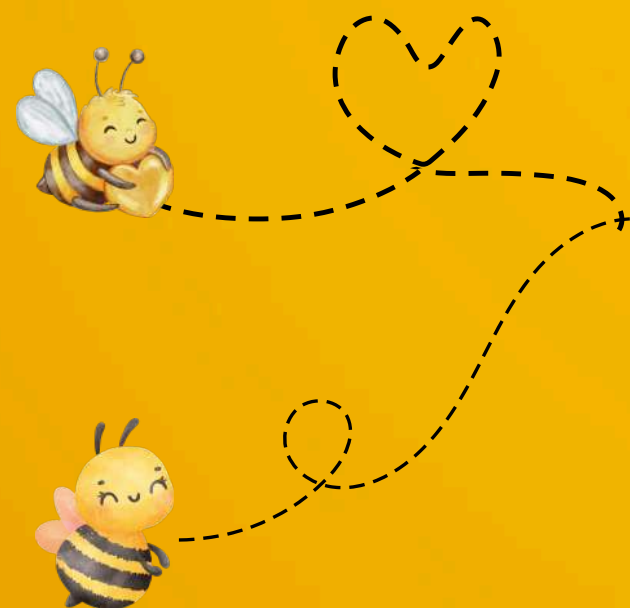




# Semi-final, Match 2

A.1

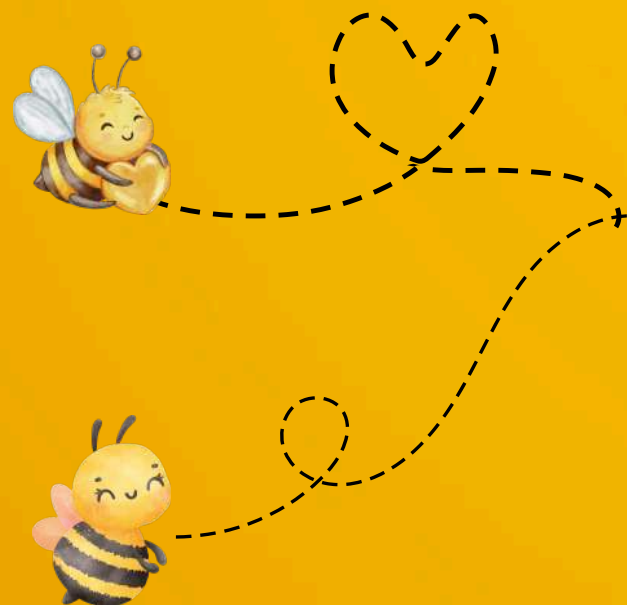
$$(\ln x)^{\ln x} + C$$



*Integration Bee*



# Safety Slide





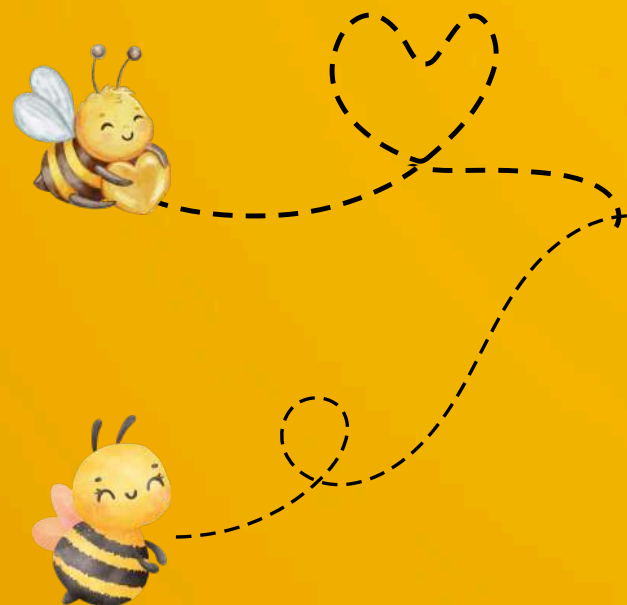


# Semi-final, Match 2

Q.2

$$\int_{\sqrt{2}}^{\infty} \frac{dx}{x + x^{\sqrt{2}}}$$

*Integration Bee*





# Safety Slide



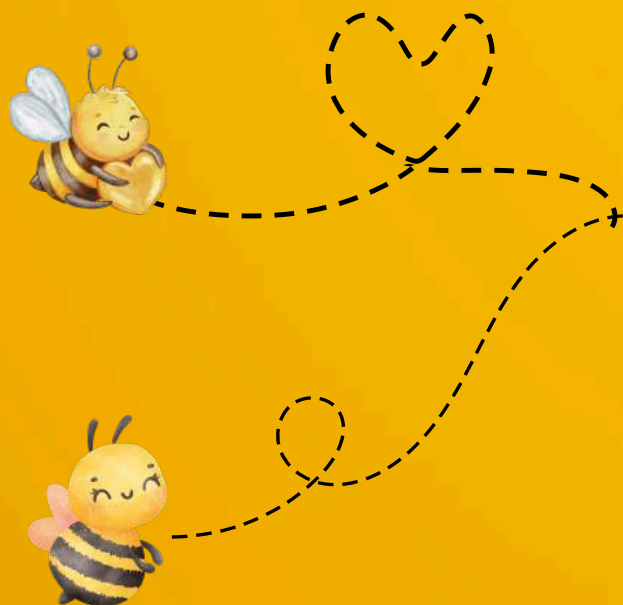


# Semi-final, Match 2

## A.2

$$\left(1 + \sqrt{2}\right) \ln \left(1 + 2^{\frac{1-\sqrt{2}}{2}}\right)$$

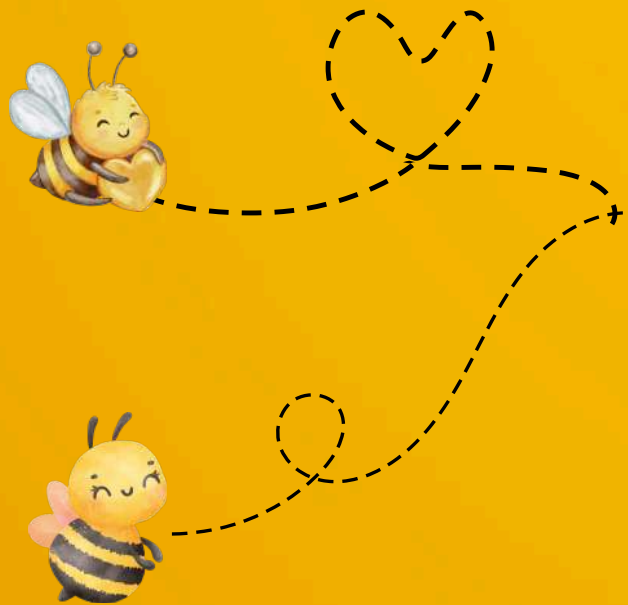
*Integration Bee*







# Safety Slide



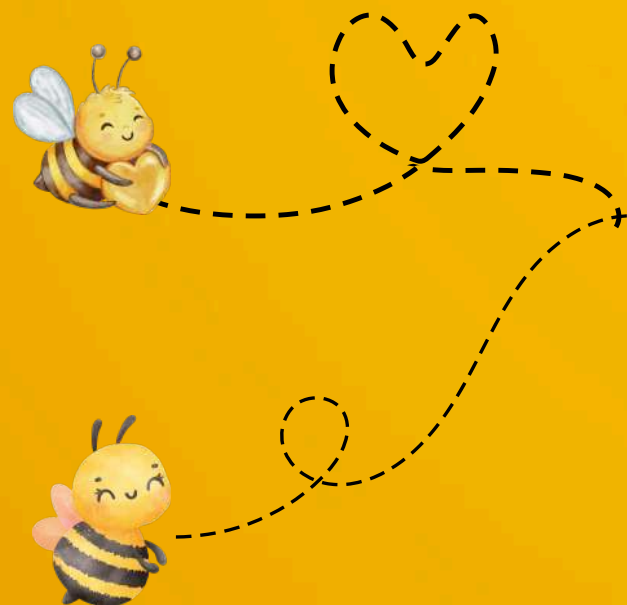


# Semi-final, Match 2

Q.3

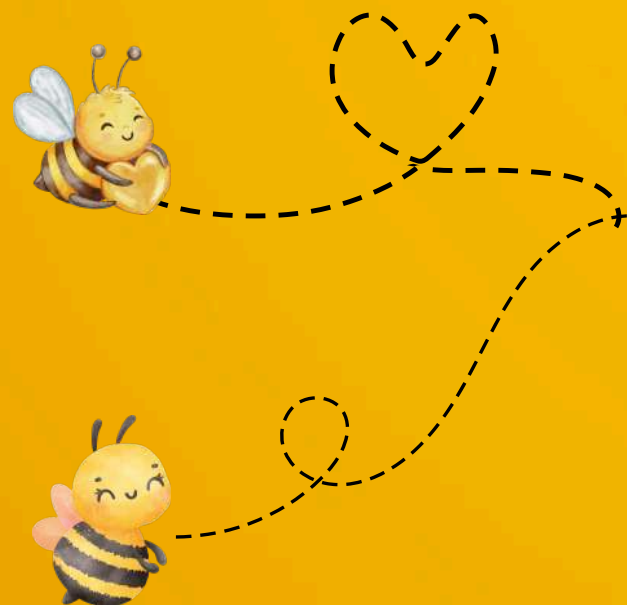
$$\int_{-\infty}^{\infty} \frac{x^2}{x^4 + x^3 - x^2 - x + 1} dx$$

*Integration Bee*





# Safety Slide





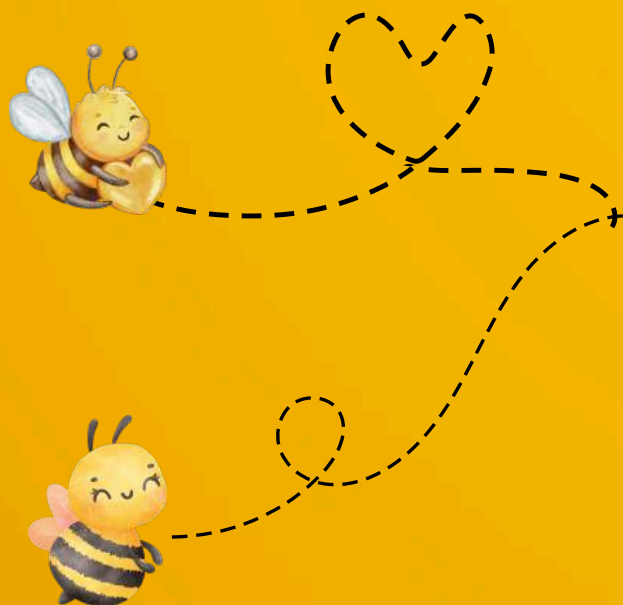


# Semi-final, Match 2

A.3

$$\frac{2\pi}{\sqrt{3}}$$

*Integration Bee*





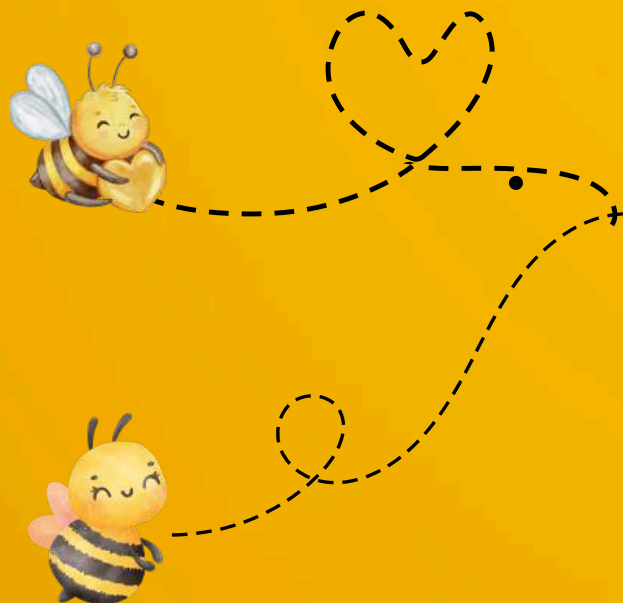
# Safety Slide





# Final

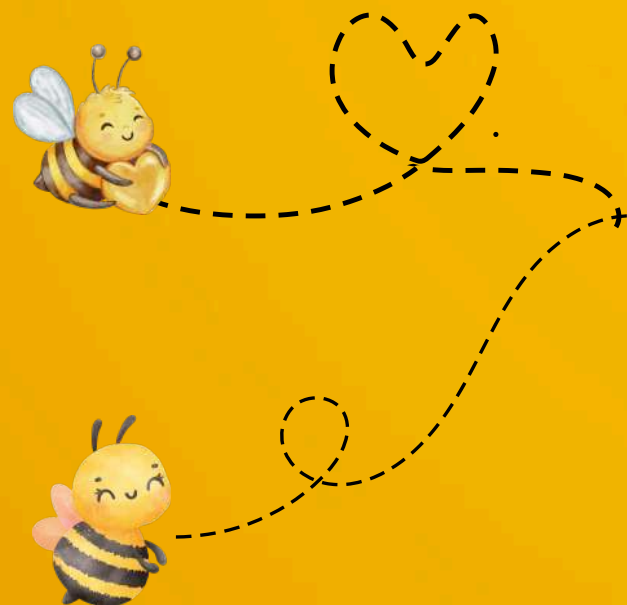
- The remaining 2 participants from the semis compete in 1-on-1 matches.
- Each match consists of 5 questions.
- The participant who answers the most questions correctly first advances.
- In case of a tie, an additional tiebreaker question will be given.







- You must encircle your final answer before submission.
- Only the answer inside the circle will be considered; calculations will not be checked.
- Once an answer is encircled, no changes can be made.
- If the encircled answer is correct, that participant wins the point.
- If the answer is incorrect, the opponent gets a chance to answer within 3 minutes.
- If both fail to get the correct answer within 3 minutes, no one gets the point.





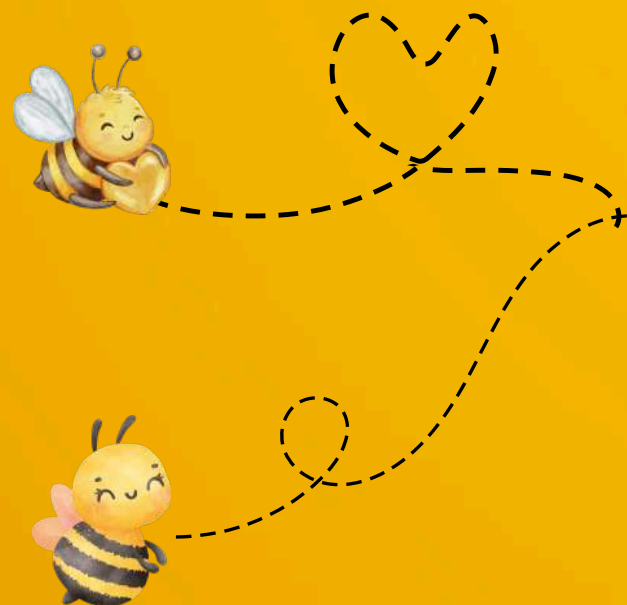
- If a round ends in a tie, a tiebreaker question will be provided.
- The same rules apply; the participant who solves it correctly first wins.
- If neither gets it right within 3 minutes, the round remains undecided





# Final

*Integration Bee*





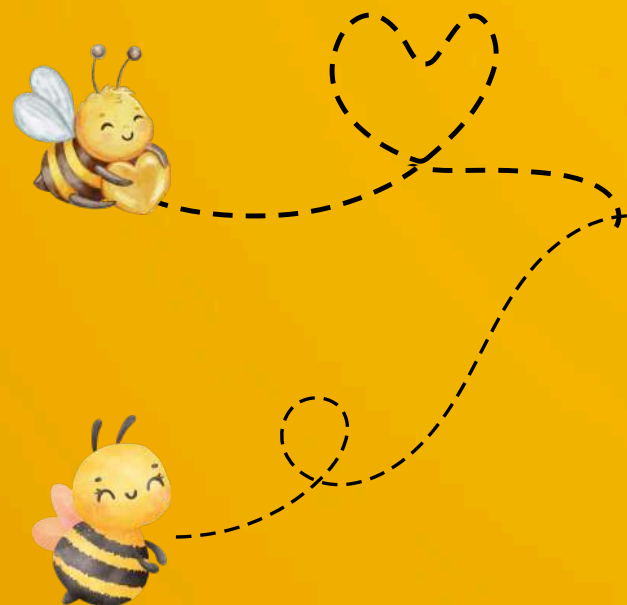


# Final

## Q.1

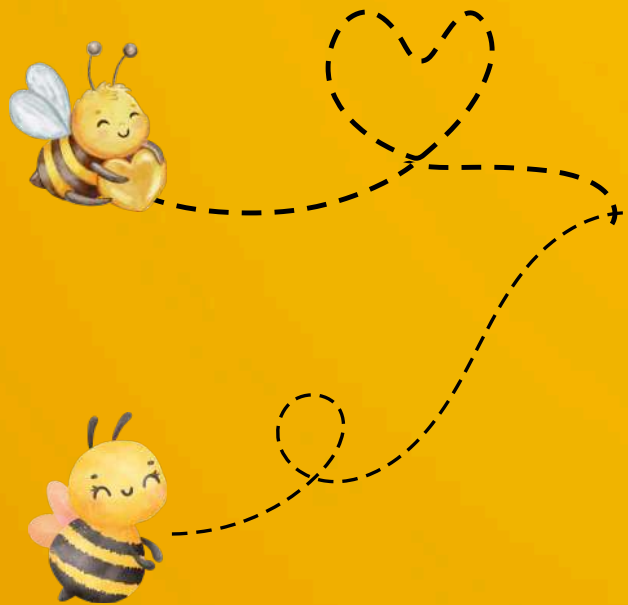
$$\int \frac{\tan^{-1} x}{x^4} dx$$

*Integration Bee*





# Safety Slide

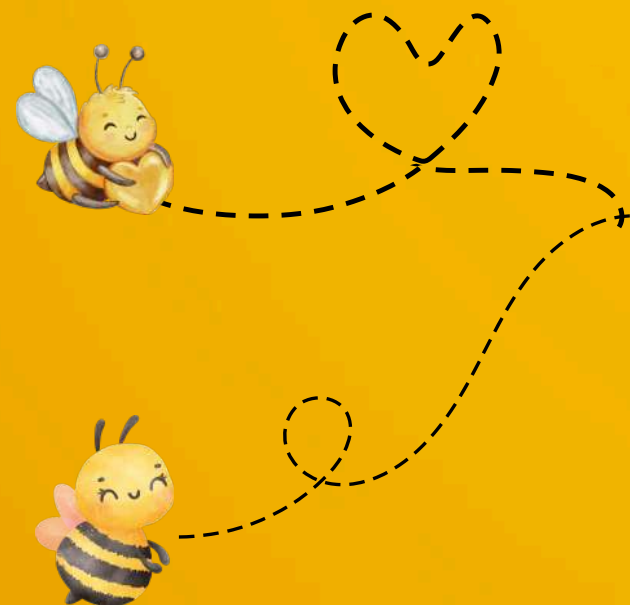




# Final

## A.1

$$\frac{-\tan^{-1}x}{3x^3} + \frac{1}{6}\ln\left(\frac{x^2+1}{x^2}\right) - \frac{1}{6x^2} + C$$

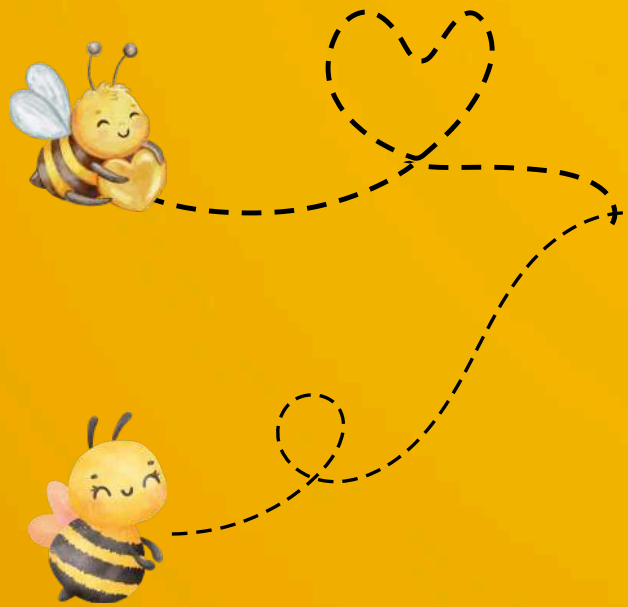


## *Integration Bee*





# Safety Slide

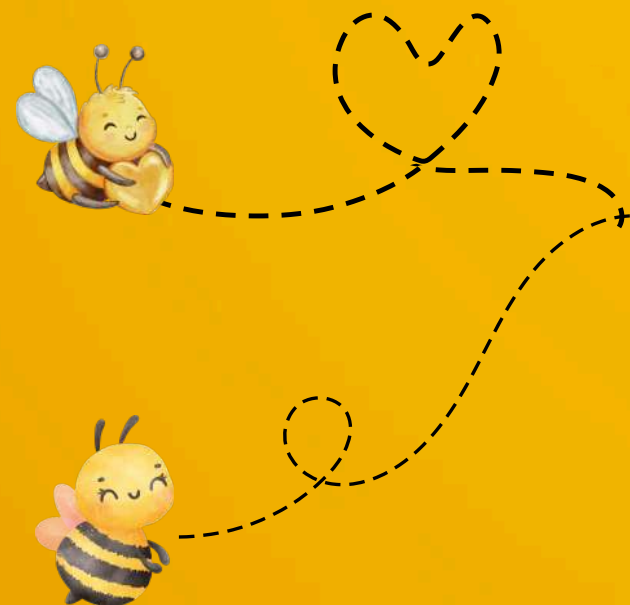




# Final

## Q.2

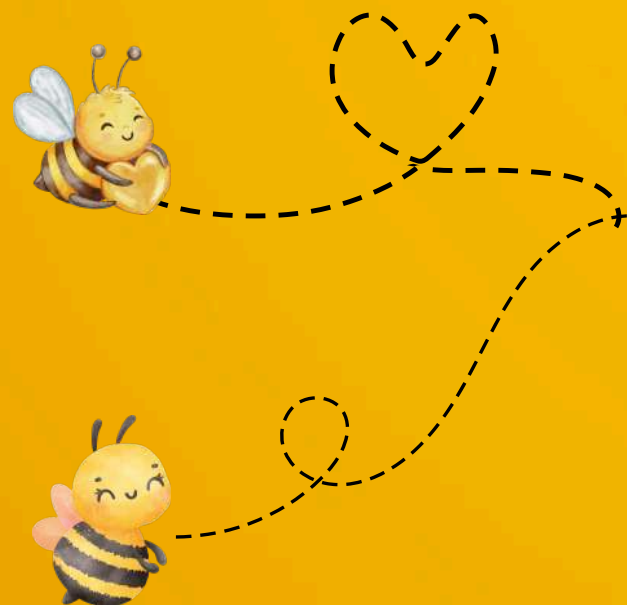
$$\int_0^{\infty} \ln \left( 1 + \frac{6}{x^2} \right) dx$$



*Integration Bee*



# Safety Slide





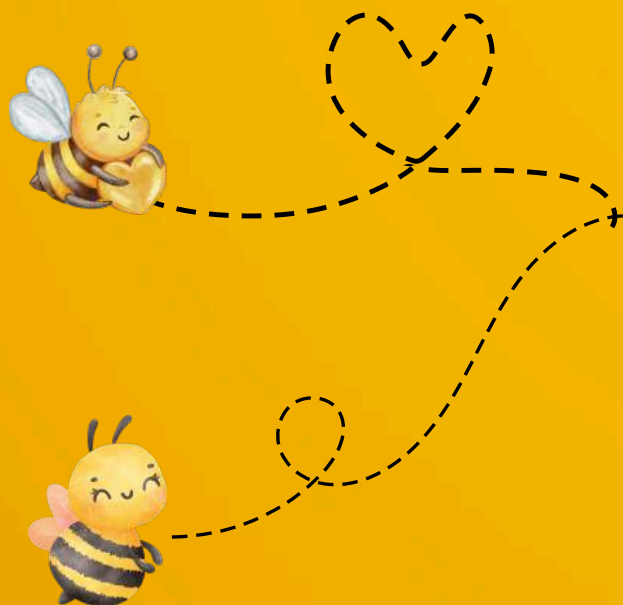


# Final

## A.2

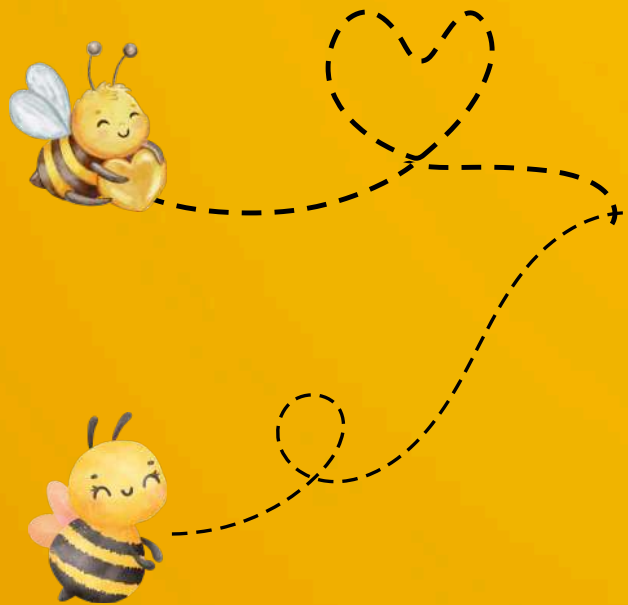
$$\pi\sqrt{6}$$

*Integration Bee*





# Safety Slide



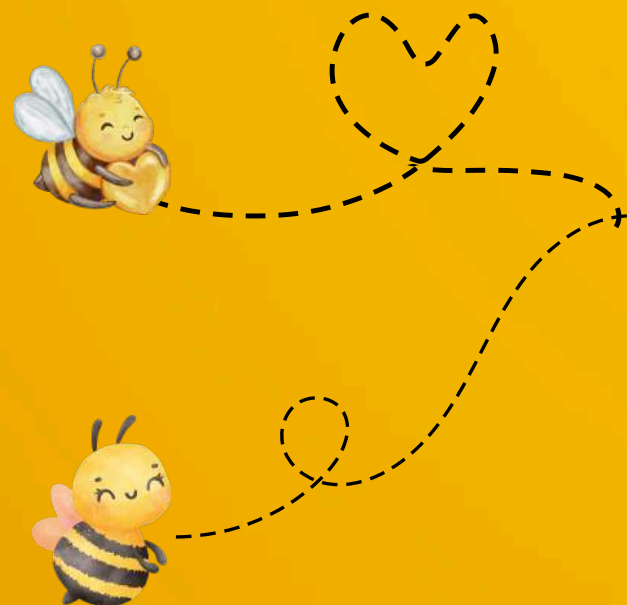


# Final

## Q.3

$$\int_{-\infty}^{\infty} \frac{e^{-(x+1)\left(x+\frac{1}{\varphi}\right)}}{1+e^{-\varphi x}} dx$$

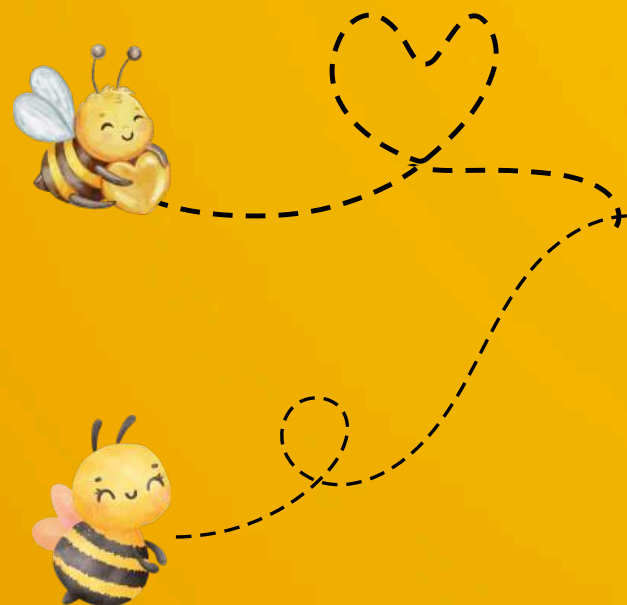
*Integration Bee*







# Safety Slide



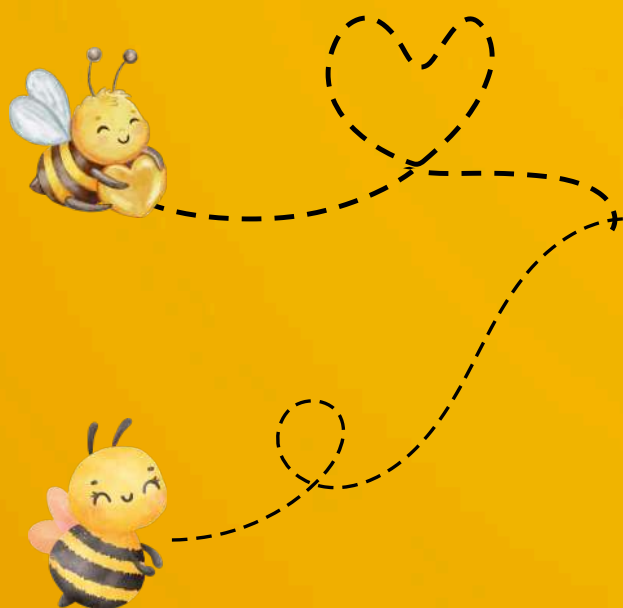


# Final

## A.3

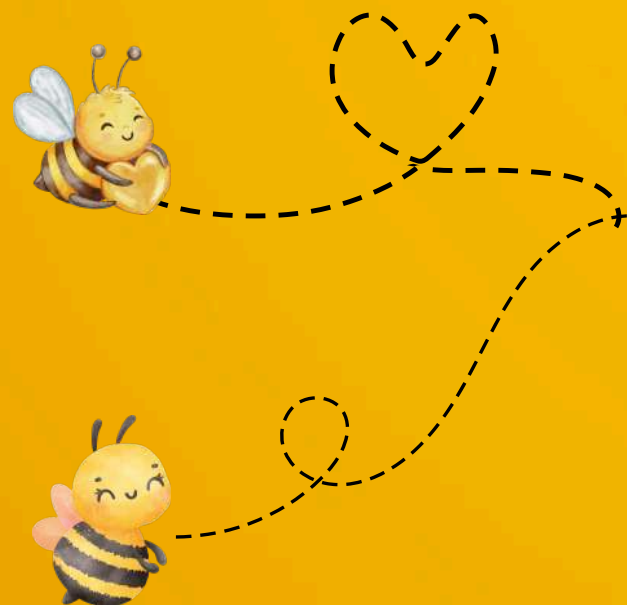
$$\frac{\sqrt{\pi}}{2} e^{-\frac{1}{\varphi}}$$

*Integration Bee*





# Safety Slide





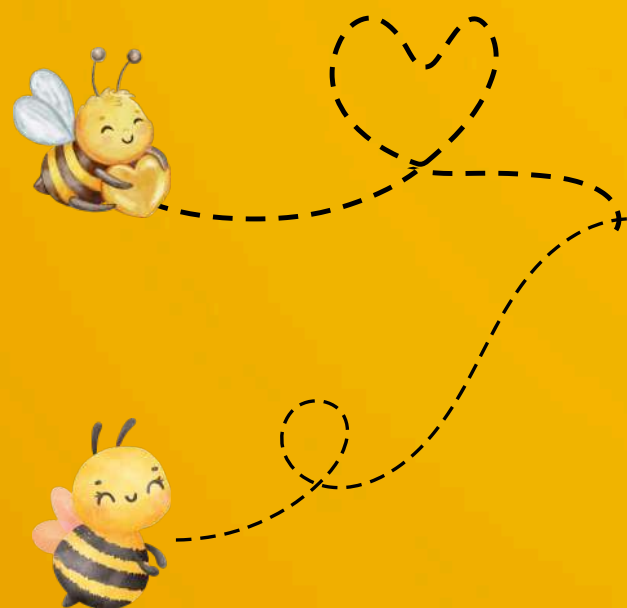


# Final

## Q.4

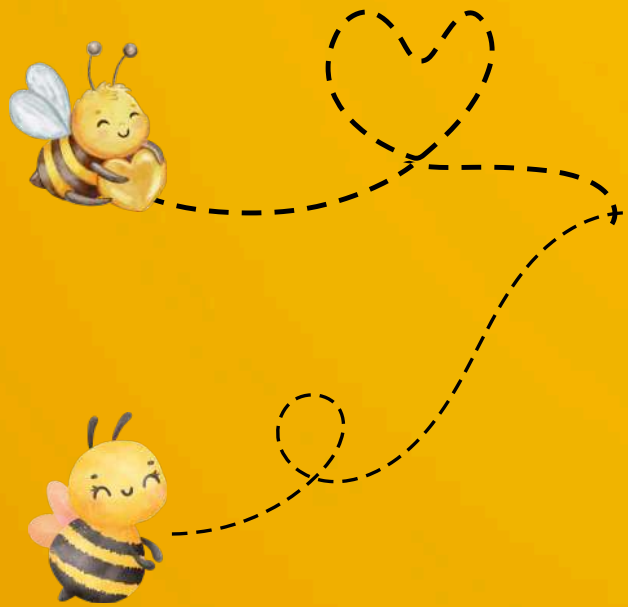
$$\int_{-1}^1 \frac{x \cos^{-1}(x)}{1+x^2} dx$$

*Integration Bee*





# Safety Slide

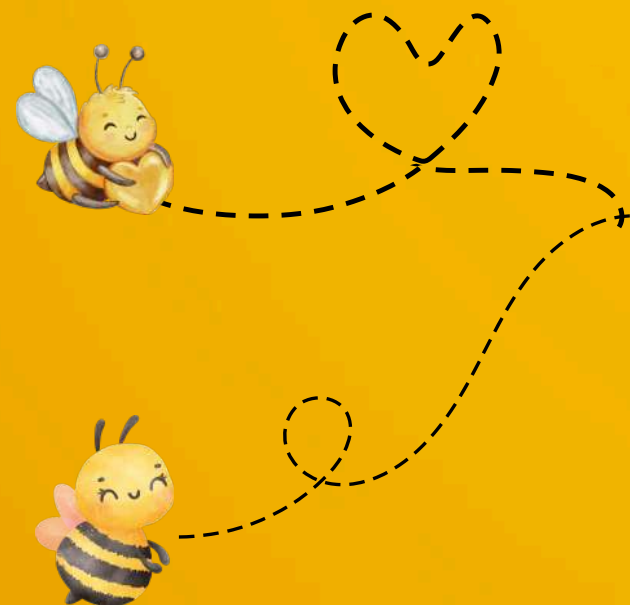




# Final

## A.4

$$-\pi \ln(4 - 2\sqrt{2})$$

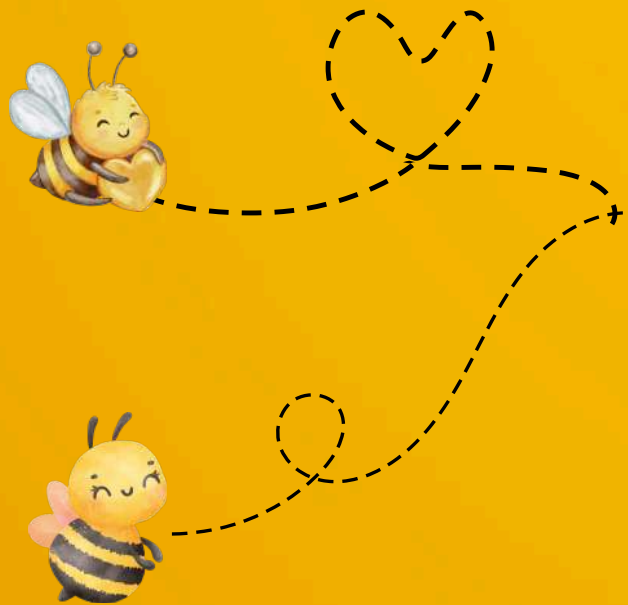


*Integration Bee*





# Safety Slide

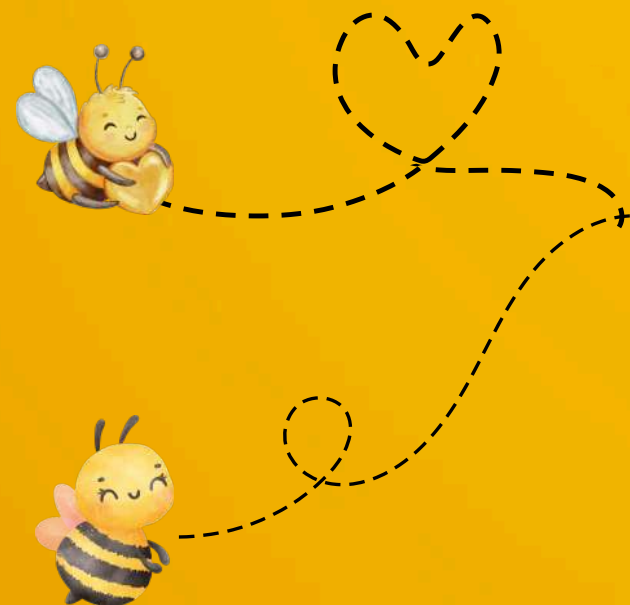




# Final

## Q.5

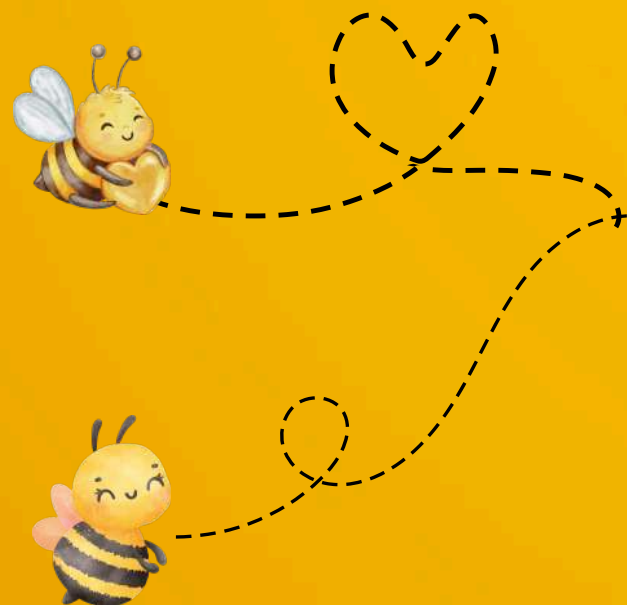
$$\int_{-1}^1 \ln(x^2) \ln(1 - x^2) dx$$



*Integration Bee*



# Safety Slide





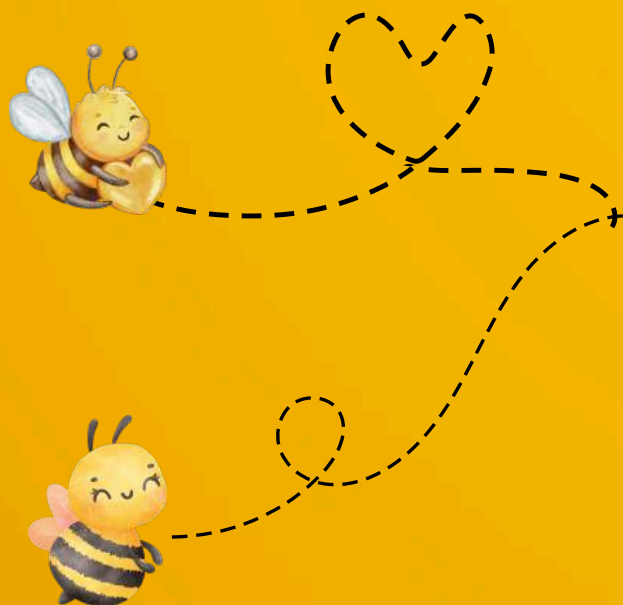


# Final

## A.5

$$16 - \pi^2 - 8 \ln(2)$$

*Integration Bee*



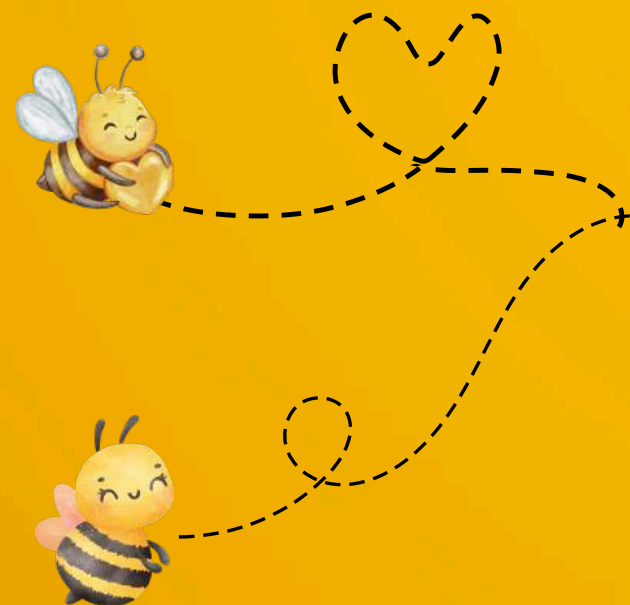


# Safety Slide





# TIE BREAKERS



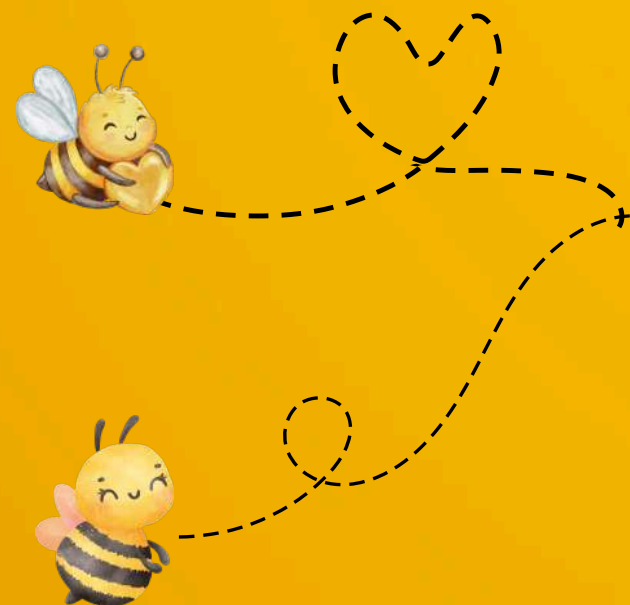
*Integration Bee*





# Q.1

$$\int_0^{\infty} \sum_{n=1}^{\infty} \frac{dx}{x^2 + n^4}$$



*Integration Bee*



# Safety Slide



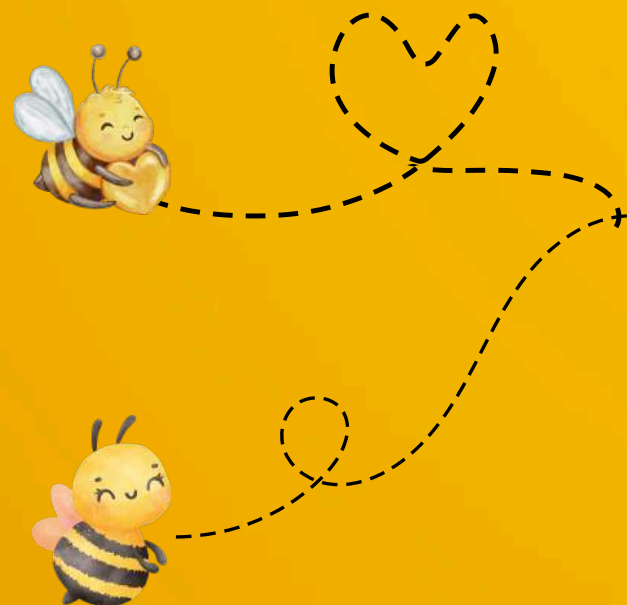


# Tie Breaker

A.1

$$\frac{\pi^3}{12}$$

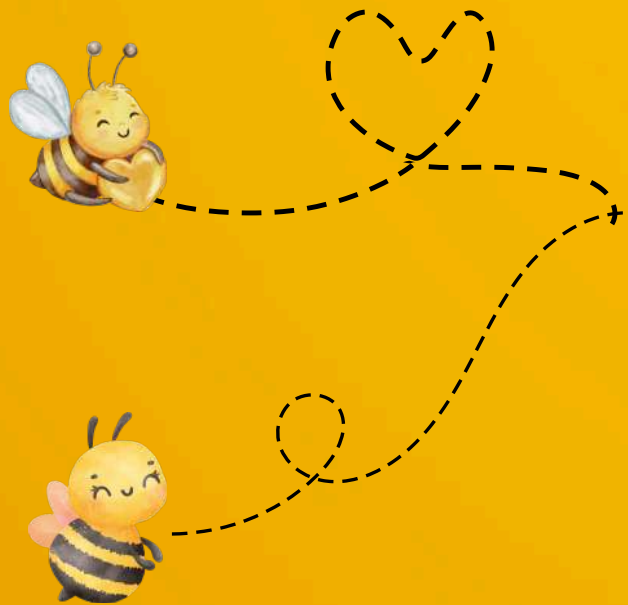
*Integration Bee*







# Safety Slide



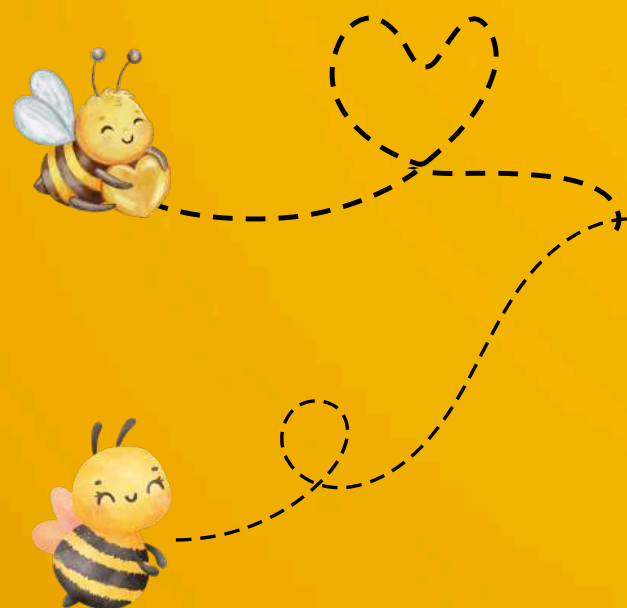


# Tie Breaker

Q.2

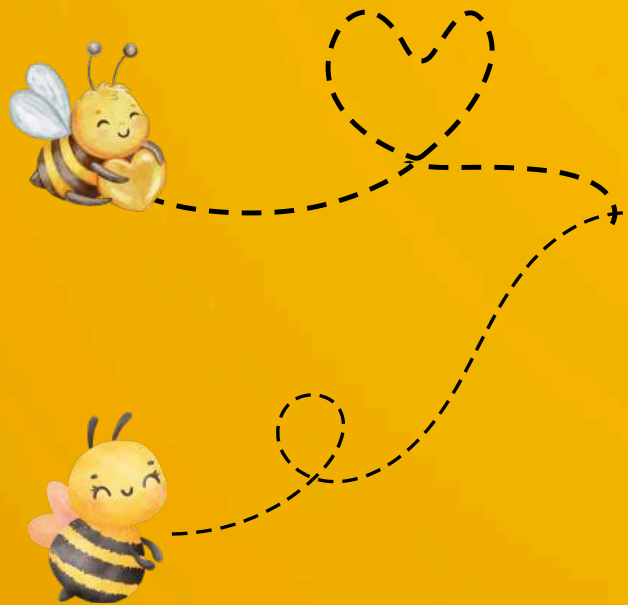
$$\int_0^{\infty} \frac{dx}{\sqrt{1 + \sqrt{e^x}}}$$

*Integration Bee*





# Safety Slide





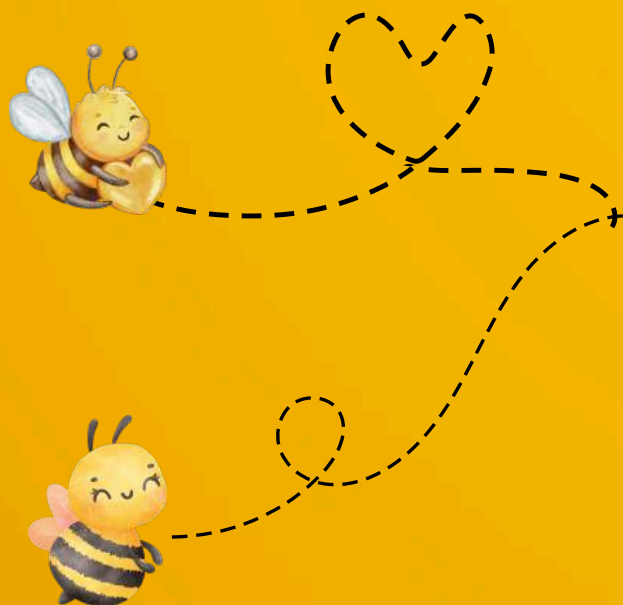


# Tie Breaker

A.2

$$2 \ln(3 + 2\sqrt{2})$$

*Integration Bee*





# Safety Slide



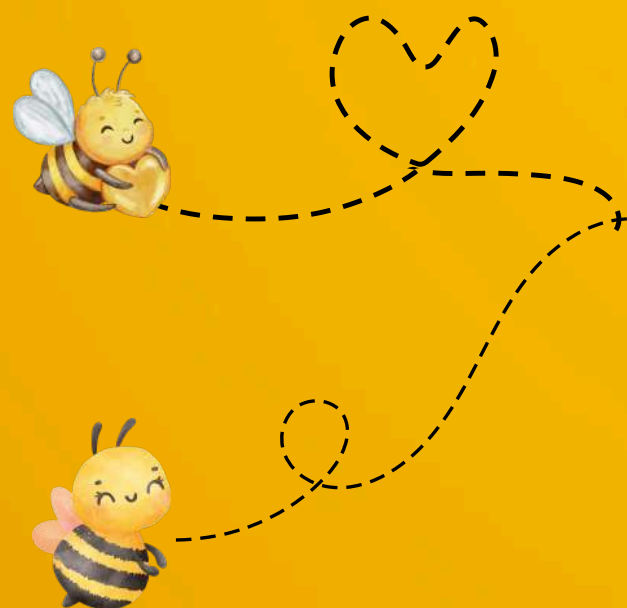


# Tie Breaker

Q.3

$$\int \frac{1}{1+x^4} dx$$

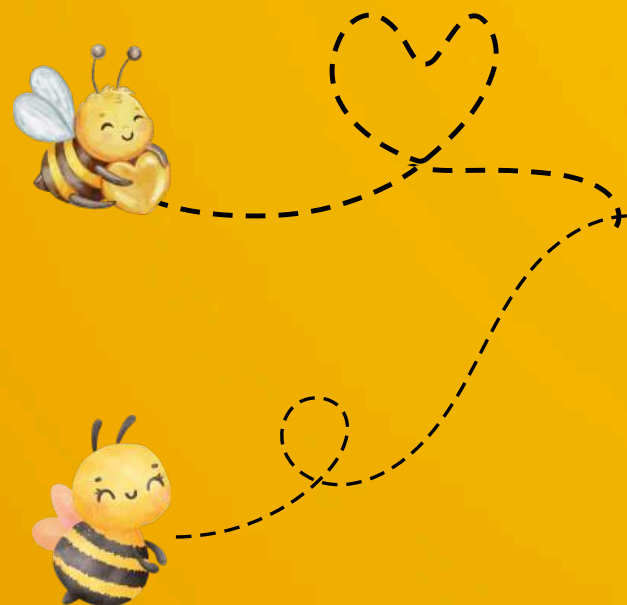
*Integration Bee*







# Safety Slide

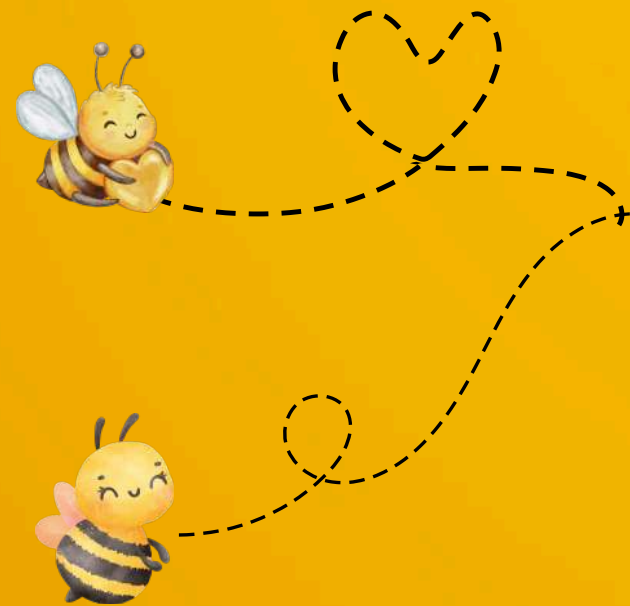




# Tie Breaker

## A.3

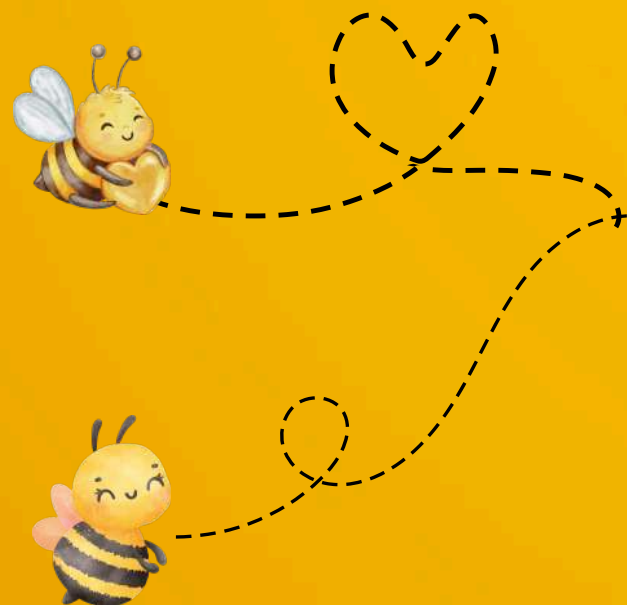
$$\frac{1}{2\sqrt{2}} \ln \left| \frac{x^2 - \sqrt{2}x + 1}{x^2 + \sqrt{2}x + 1} \right| + \frac{1}{\sqrt{2}} \arctan \left( \frac{x^2 - 1}{\sqrt{2}x} \right) + C$$



*Integration Bee*



# Safety Slide





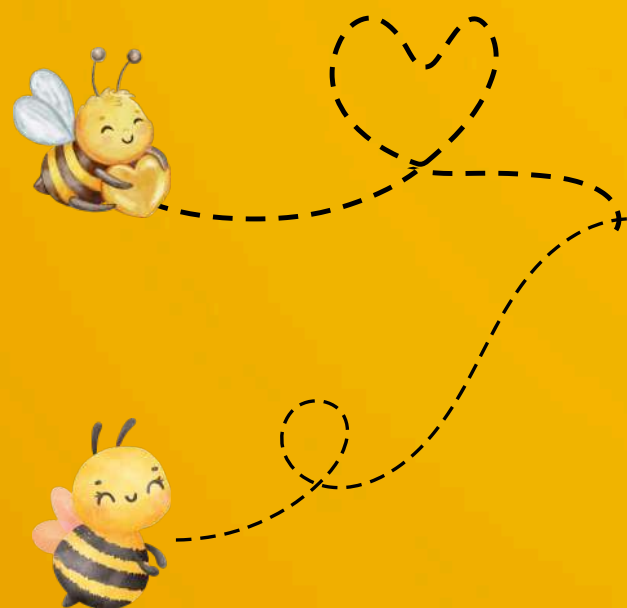


# Tie Breaker

Q.4

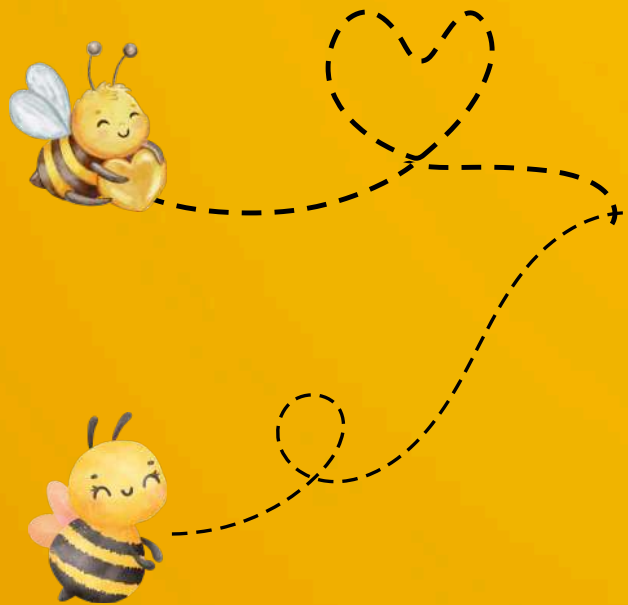
$$\int_0^1 x \sqrt{x \sqrt{x \sqrt{\cdots}}} dx$$

*Integration Bee*





# Safety Slide



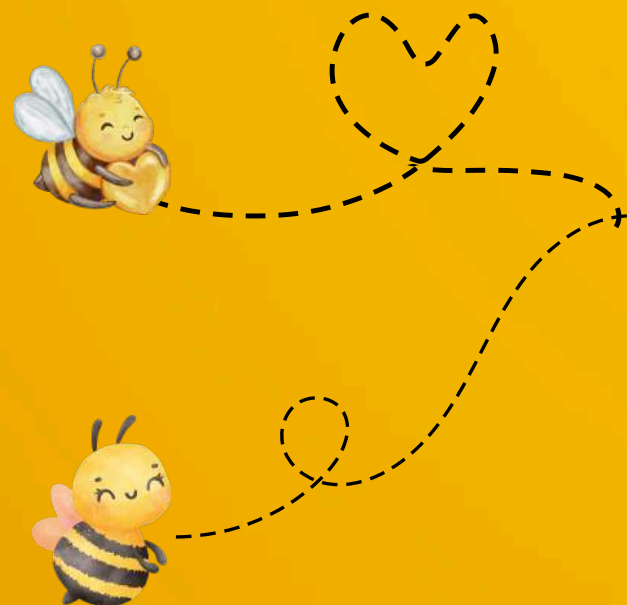


# Tie Breaker

A.4

$$\frac{1}{3}$$

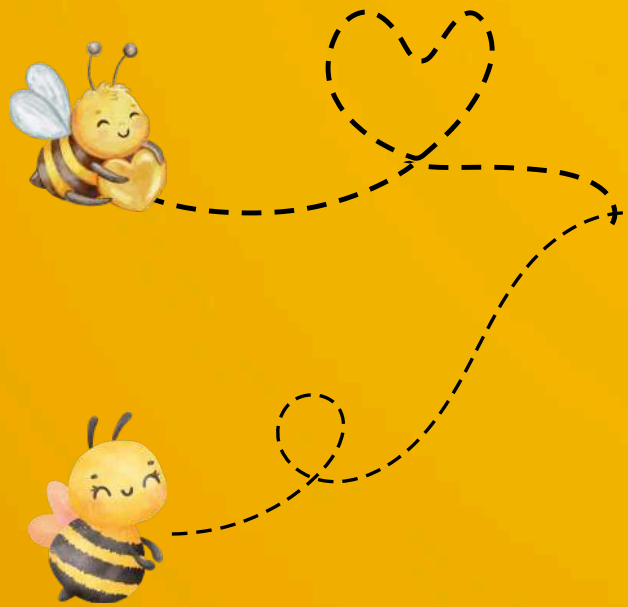
*Integration Bee*







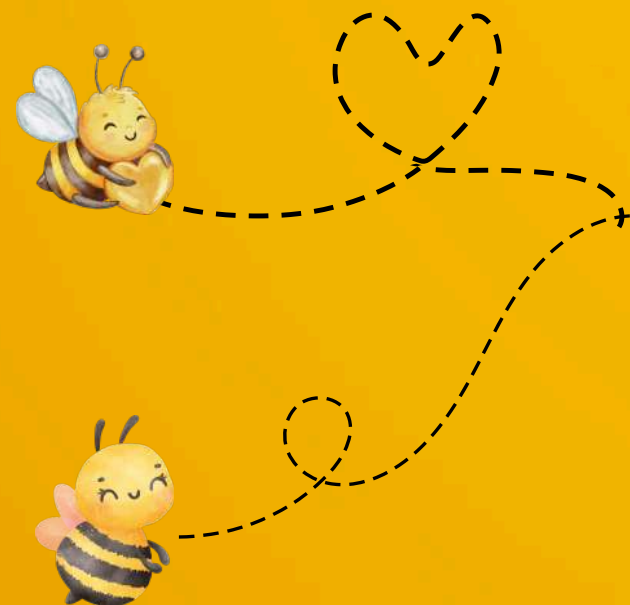
# Safety Slide





# Q.5

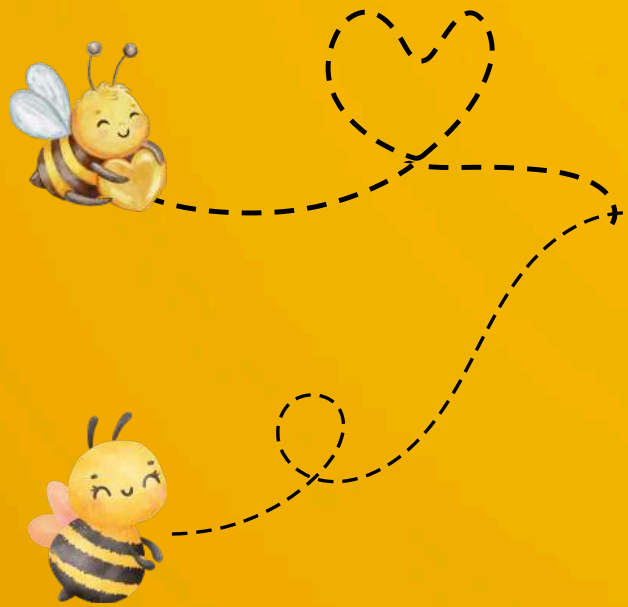
$$\int (1 + \ln(x))^{2024} (\ln(x) + 2026) dx$$



*Integration Bee*



# Safety Slide



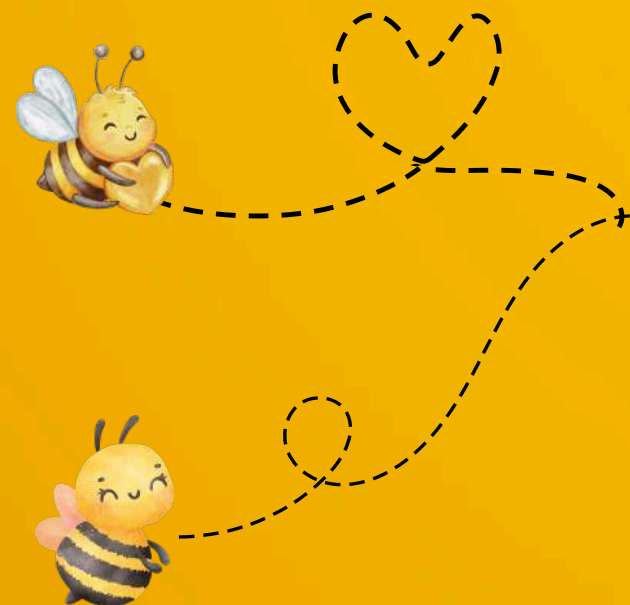




# Tie Breaker

A.5

$$x(1 + \ln(x))^{2025} + C$$



*Integration Bee*



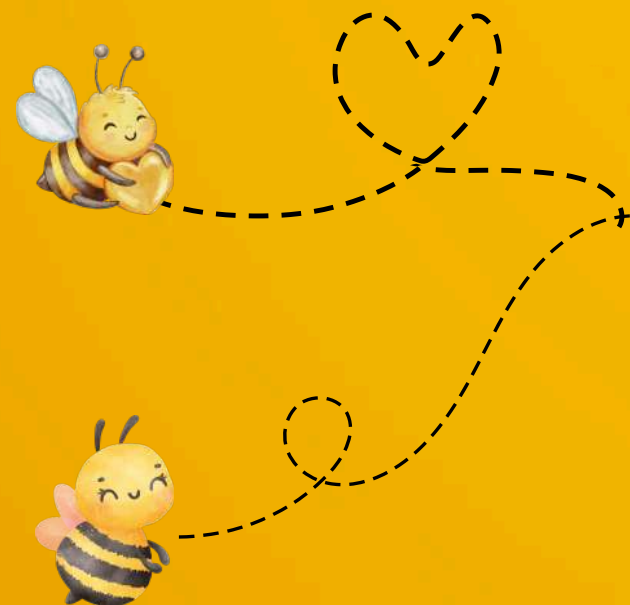
# Safety Slide





# Q.6

$$\int_0^{\infty} \left(1 + \frac{1}{x}\right)^x \left( \ln \left(1 + \frac{1}{x}\right) - \frac{1}{x+1} \right) dx$$

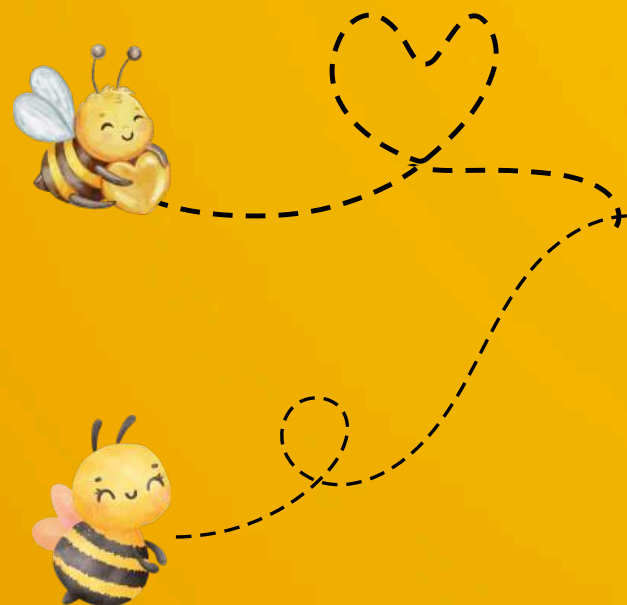


*Integration Bee*





# Safety Slide

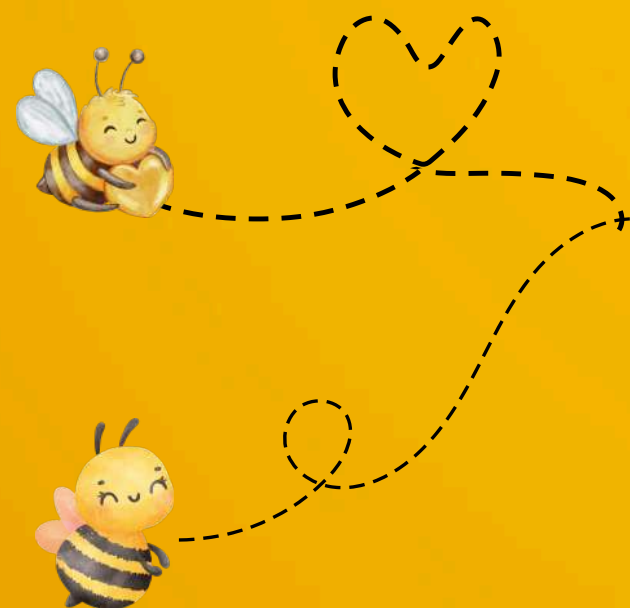




# Tie Breaker

A.6

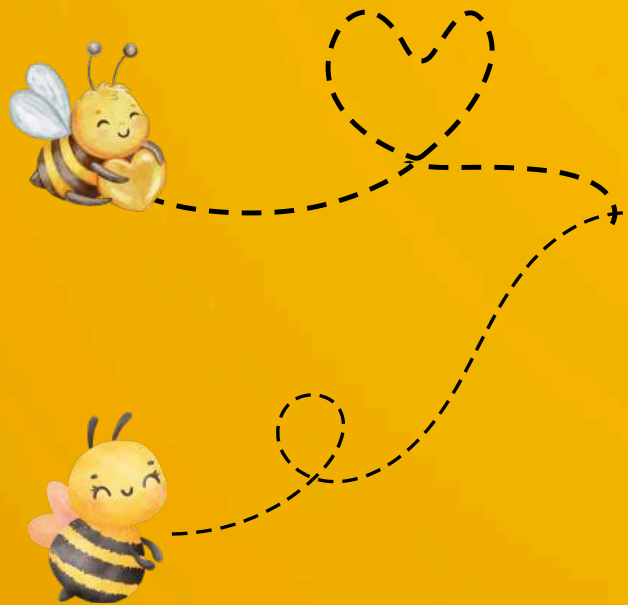
$e - 1$



*Integration Bee*



# Safety Slide



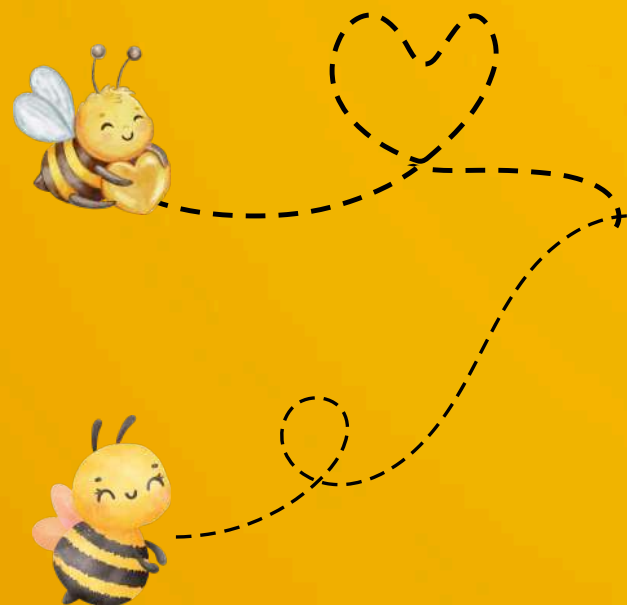




# Q.7

$$\lim_{n \rightarrow \infty} \int_0^{\sqrt{n}} \cos^n \left( \frac{x}{\sqrt{n}} \right) dx$$

*Integration Bee*





# Safety Slide

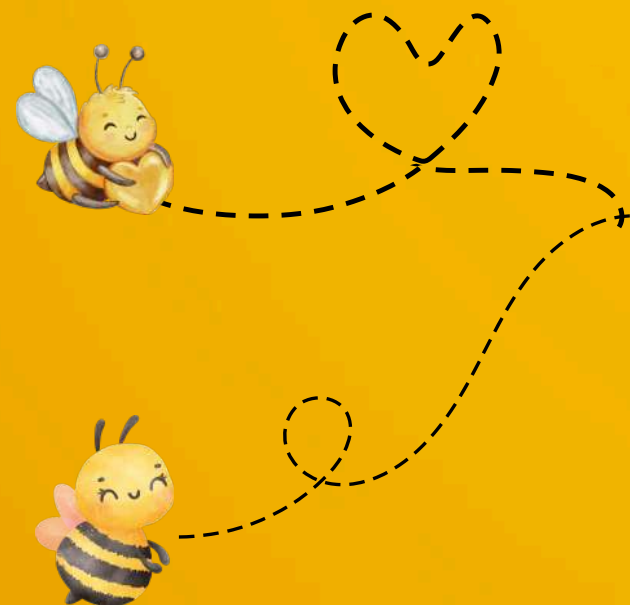




# Tie Breaker

A.7

$$\frac{\sqrt{2\pi}}{2}$$

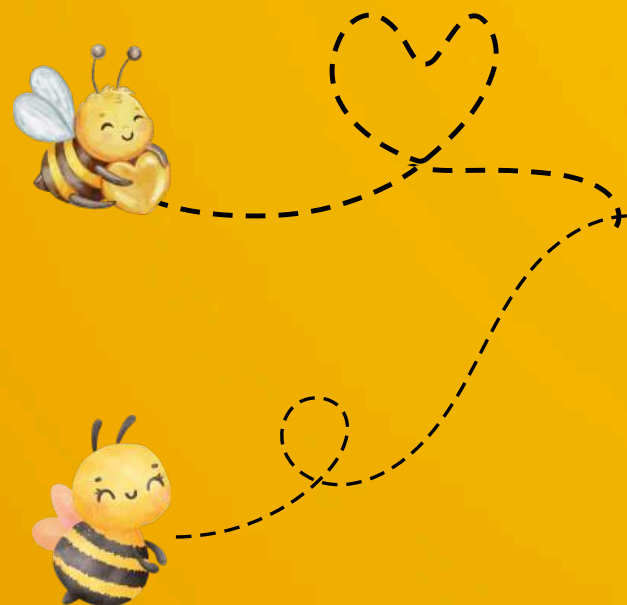


*Integration Bee*





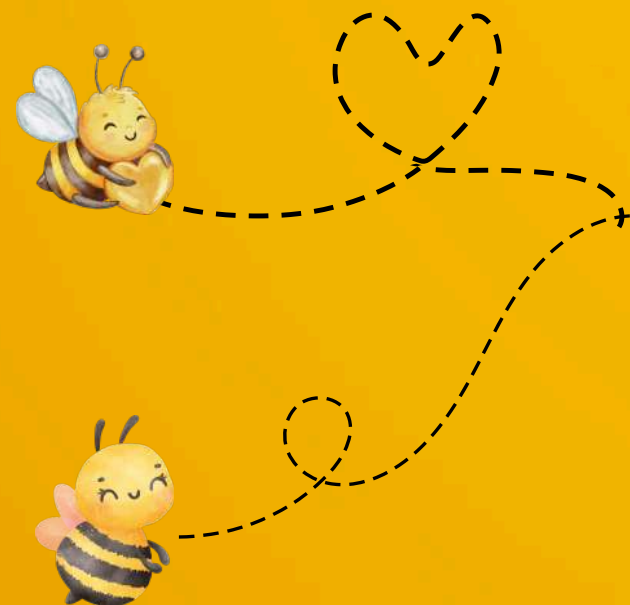
# Safety Slide





# Q.8

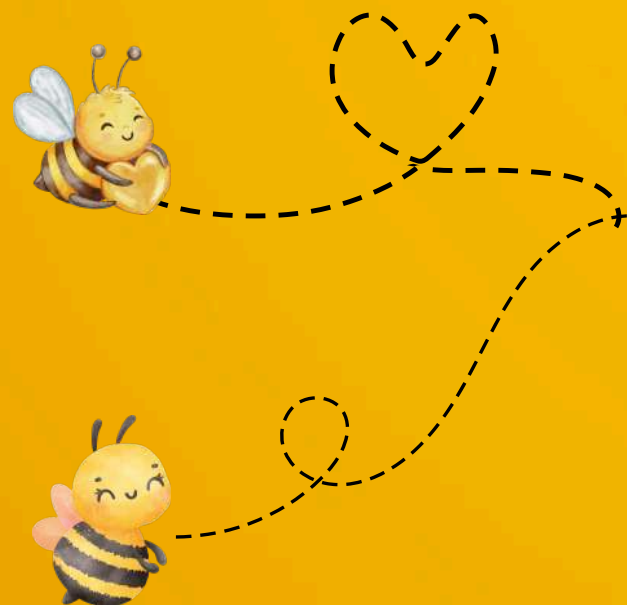
$$\int_1^9 \frac{dx}{\sqrt{x}\sqrt{x} + x} - \sqrt{x}\sqrt{x} - x$$



## Integration Bee



# Safety Slide





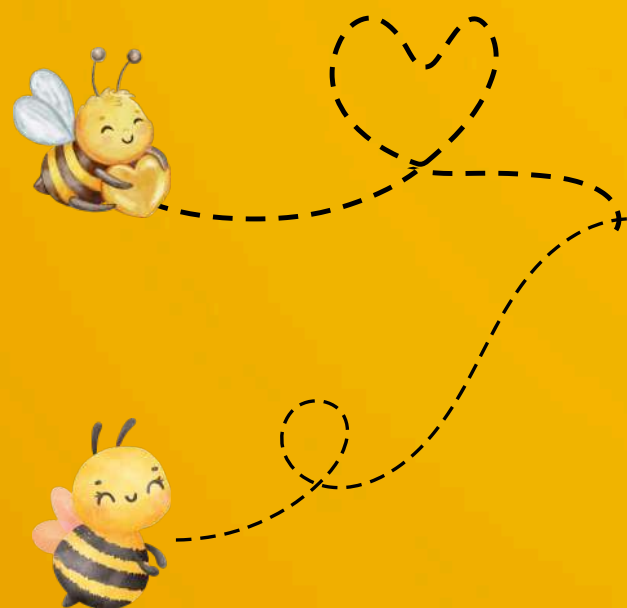


# Tie Breaker

A.7

$$\frac{16}{3}$$

*Integration Bee*





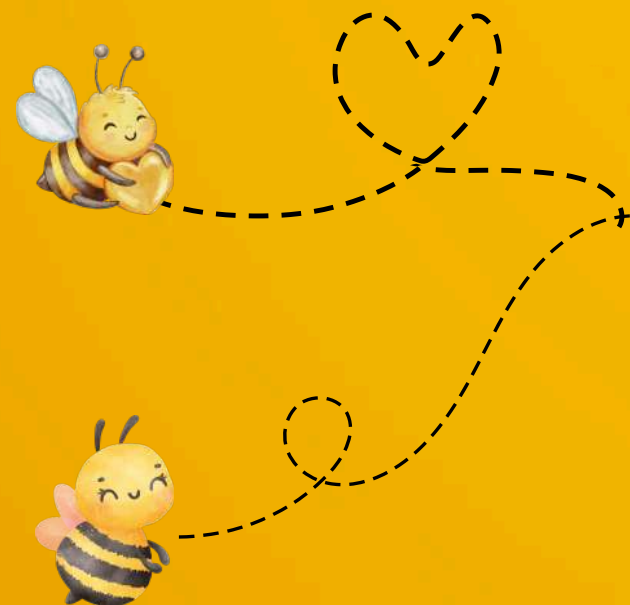
# Safety Slide





Q.9

$$\int \sin(2026x) \sin^{2024}(x) dx$$

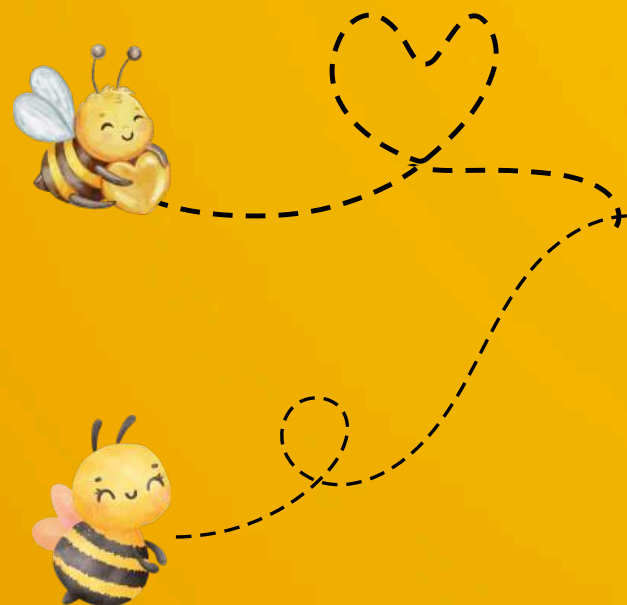


*Integration Bee*





# Safety Slide



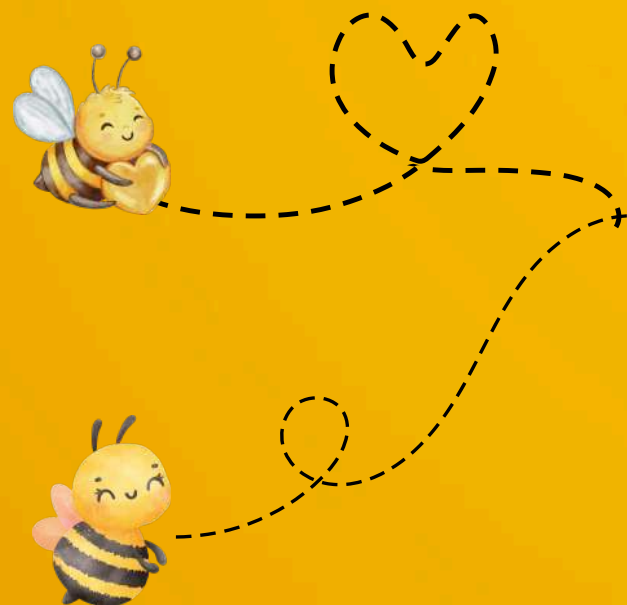


# Tie Breaker

A.8

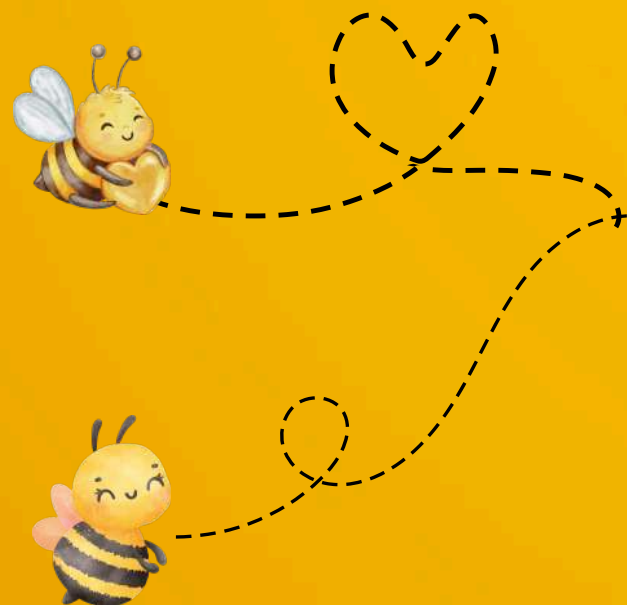
$$\frac{\sin(2025x)\sin^{2025}(x)}{2025}$$

*Integration Bee*





# Safety Slide



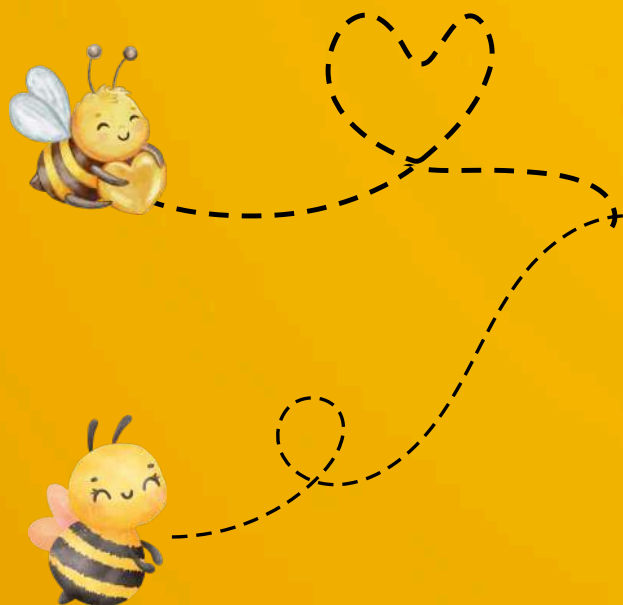




# Tie Breaker

$$\int_0^1 (x^2)^{\frac{-1}{\ln \sqrt{x}}} dx$$

*Integration Bee*

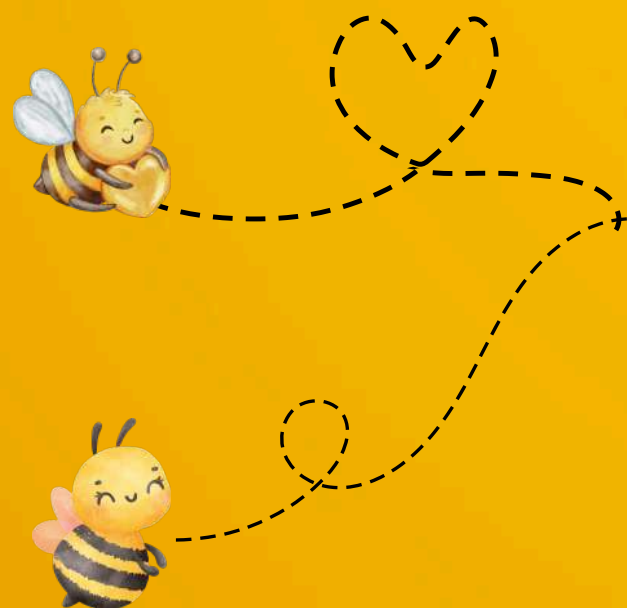




# Tie Breaker

$$\int_0^{\infty} \frac{2}{(1+x^2)(1+x^4)} dx$$

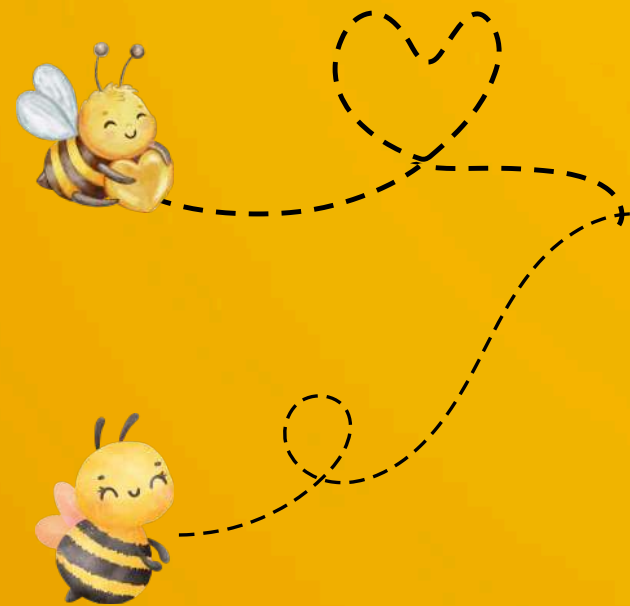
*Integration Bee*





# Tie Breaker

$$\int_0^{6\pi} \sin x - 2x + \sin(\sin x - 2x) dx$$



*Integration Bee*

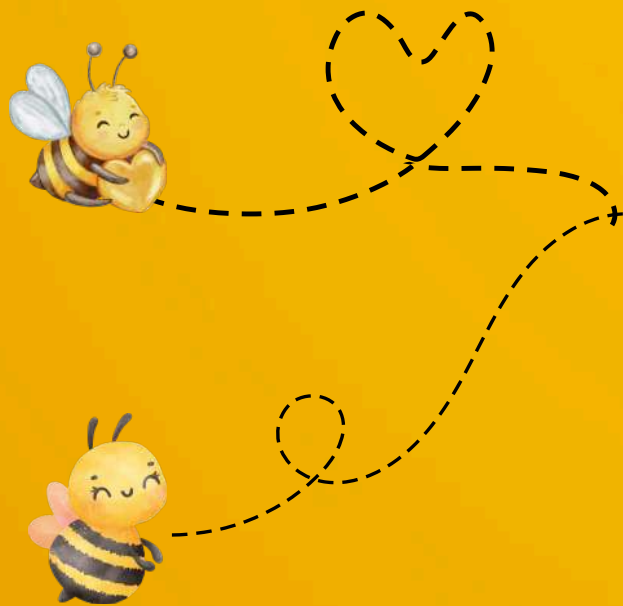




# Tie Breaker

$$\int \frac{x^3}{1 + x + \frac{x^2}{2} + \frac{x^3}{6}} dx$$

*Integration Bee*

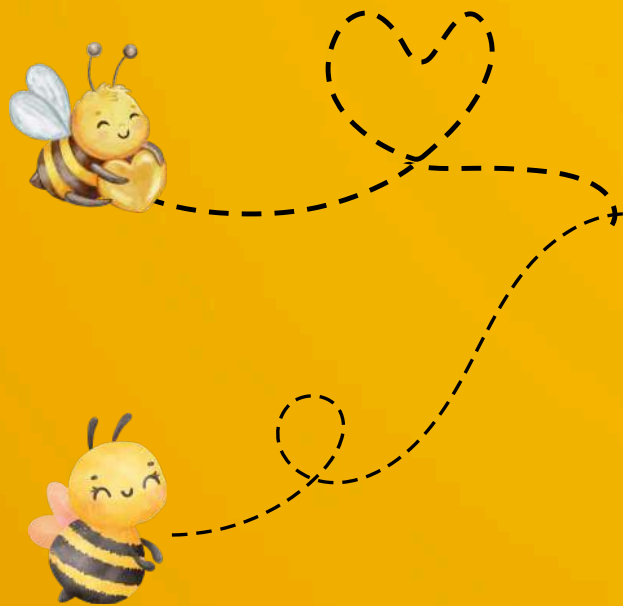




# Tie Breaker

$$\int_0^{\infty} \frac{1}{\left(x + \frac{1}{x}\right)^2} dx$$

*Integration Bee*

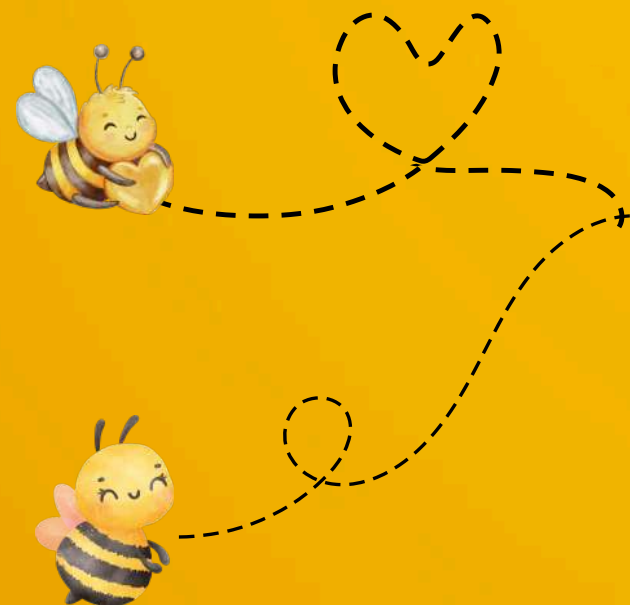




# Tie Breaker

$$\lim_{n \rightarrow \infty} \int_0^3 \sin\left(\frac{\pi}{3} \sin\left(\frac{\pi}{3} \sin(\dots \sin(\frac{\pi}{3} x) \dots)\right)\right) dx$$

**Where “n” is the number of “sine” terms in above expression**



*Integration Bee*





# Tie Breaker

$$\int (1 + \log(x)) \log \log(x) dx$$

*Integration Bee*

