

Spot the mistake relay and maths taboo for A Level Maths: answers

A Level Math Revision · A Level Maths (Year 12 and Year 13) · Teacher answers and notes

A calculator is needed for task B.

Teacher notes

- Relay: teams of three. Give each team the first worked solution; when they bring you the mistake and the corrected answer, they get the next one. The first team through all six wins.
- Every slip here is one of the common mistakes on our [Edexcel A Level Examiner Insights page](#), in a new example of our own. Show the page afterwards so students can see which mistakes cost the most marks.
- Taboo cards: one student describes the word without saying it or any of the banned words; their team guesses. The sample clue on each card shows that it can be done.
- Pictionary (no words or numbers allowed on the board, 60 seconds each): asymptote, tangent, normal, vector, point of inflection, radian, box plot, moment.

Starter

1. **$1 - 2\theta^2$**
 - Bracket the whole angle: $1 - (2\theta)^2/2 = 1 - 4\theta^2/2$
2. **$54x^2$**
 - $(3x)^2 = 9x^2$, so $6 \times 9x^2$
3. **$1/16$**
 - $P(X > 3) = 1 - P(X \leq 3) = P(X = 4) = 1/16$

Task A: Relay, part 1

- a. **$xe^x - e^x + c$**
 - Mistake: a sign. By parts, $\int u dv = uv - \int v du$.
 - $xe^x - \int e^x dx = xe^x - e^x + c$
- b. **(3, 5)**
 - Mistake: $f(2x)$ is a stretch with scale factor $\frac{1}{2}$ parallel to the x-axis.
 - $(6 \div 2, 5) = (3, 5)$
- c. **$5 \cos(\theta - 53.1^\circ)$**
 - Mistake: the ratio is upside down. $R \cos \alpha = 3$ and $R \sin \alpha = 4$, so $\tan \alpha = 4/3$.
 - $\alpha = 53.1^\circ$

Task B: Relay, part 2

- a. **8**
 - Mistake: fg means do g first, then f.
 - $fg(1) = f(g(1)) = f(4) = 8$
- b. **0.841**
 - Mistake: a continuity correction is only for approximating a discrete distribution.
 - $P(Z < 1) = 0.841$

c. **Add the conclusion**

- Mistake: no conclusion. $f(2) < 0 < f(3)$ and f is continuous on $[2, 3]$, so there is a change of sign and a root between 2 and 3.

Task C: Maths taboo

- a. **Sample clue: 'Undoes differentiation, like adding up lots of thin strips.'**
- The word is integral. Any clue that avoids the banned words is fine.
- b. **Sample clue: 'Something with both how big and which way, like a velocity.'**
- The word is vector. Any clue that avoids the banned words is fine.
- c. **Sample clue: 'An expression like $3a^3 + 2a - 7$, with whole-number indices.'**
- The word is polynomial. Any clue that avoids the banned words is fine.
- d. **Sample clue: 'A rule that turns each number you put in into exactly one number.'**
- The word is function. Any clue that avoids the banned words is fine.

Extension

1. **$(x - 3)^2 + 1 \geq 1 > 0$**

- Mistake: the reasoning is incomplete, and a square can be 0.
- $x^2 - 6x + 10 = (x - 3)^2 + 1$. Since $(x - 3)^2 \geq 0$, the expression is at least 1, so it is always positive.

Every question is original and every answer was recomputed by computer before publishing.