

Spot the mistake relay and maths taboo for A Level Maths

A Level Math Revision · A Level Maths (Year 12 and Year 13) · Student sheet

Name _____

Class _____

Date _____

A calculator is needed for task B.

Starter (5 minutes)

1. Using $\cos \theta \approx 1 - \theta^2/2$, $\cos 2\theta \approx 1 - 2\theta^2/2 = 1 - \theta^2$

2. The x^2 term of $(1 + 3x)^4$ is $6 \times 3x^2 = 18x^2$

3. $X \sim B(4, 0.5)$: $P(X > 3) = 1 - P(X \leq 4) = 0$

Main activity (34 minutes)

Task A: Relay, part 1

Each worked solution has exactly one mistake. Find it, then give the correct answer.

a. Find $\int xe^x dx$. *Working:* $xe^x + e^x + c$.

b. $(6, 5)$ lies on $y = f(x)$. Find the matching point on $y = f(2x)$. *Working:* a stretch with scale factor 2 parallel to the x-axis gives $(12, 5)$.

c. Write $3 \cos \theta + 4 \sin \theta$ as $R \cos(\theta - \alpha)$. *Working:* $R = 5$, $\tan \alpha = 3/4$, $\alpha = 36.9^\circ$.

Task B: Relay, part 2

Each worked solution has exactly one mistake. Find it, then give the correct answer.

a. $f(x) = 2x$ and $g(x) = x + 3$. Find $fg(1)$. *Working:* $g(f(1)) = g(2) = 5$.

b. $X \sim N(20, 2^2)$. Find $P(X < 22)$. *Working:* with a continuity correction, $P(X < 22.5) = P(Z < 1.25) = 0.894$.

c. $f(x) = x^3 - 2x - 5$. Show that $f(x) = 0$ has a root between 2 and 3. *Working:* $f(2) = -1$ and $f(3) = 16$.

Task C: Maths taboo

Describe the word to your team without saying it or any of the banned words.

- a. Describe **INTEGRAL** without saying: area, under, curve, anti.
- b. Describe **VECTOR** without saying: direction, magnitude, arrow, size.
- c. Describe **POLYNOMIAL** without saying: power, term, degree, quadratic.
- d. Describe **FUNCTION** without saying: input, output, machine, map.

Extension

1. Prove that $x^2 - 6x + 10 > 0$ for all real x . *Working: squares are always positive, so it is positive.*