

Examination Technique

Multiple attempts and crossing out

“Crossed-out work should be marked unless the candidate has replaced it with an alternative response.”

“Where a candidate has made multiple responses and indicates which response they wish to submit, examiners should mark this response. If there are several attempts at a question which have not been crossed out, examiners should mark the final answer which is the answer that is the most complete.”

Circle or highlight key phrases in questions.

Tick off question parts as you go so you don't leave any parts out

Key phrases might include

3 d.p.	Hence	Exact Answer	Write down
Simplified Fraction	Nearest Integer	x is an integer, $x > 1$	
Express the probability as a %		Show - Prove - Verify	

Read the key phrases carefully

- “Give an exact answer” means leave your answer with a fraction or π or $\sqrt{\quad}$ or \ln or e in it. Don't give a rounded decimal.
- “Hence” means use what you have just found out.
- “Write down” means that there is no working – this shouldn't take you very long
- “Interpret” means that you need to write a sentence in the context of the question

Prove, Show, Verify

- Prove means $LHS \equiv \dots \equiv \dots \equiv \dots \equiv RHS$
e.g. prove that $1 + \tan^2 \theta \equiv \sec^2 \theta$ \therefore Proof complete or QED
- Show means use the information to get an answer
e.g. Show that $x = 1.41$ is a solution to the equation $x^2 = 2$ correct to 3 s.f.
- Verify means substitute a value
e.g. verify that $x = 7$ is a solution to $x^3 - 2x - 329 = 0$
When $x = 7$, $x^3 - 2x - 329 = 7^3 - 2 \times 7 - 329 = 343 - 14 - 329 = 0$
 $\therefore x = 7$ is a solution to $x^3 - 2x - 329 = 0$

Prove or Show

- If you're asked to "Prove" or "Show" something, the last line in your working should state the answer. It's not just enough to write "As required" or "Q.E.D." – you must write out the statement.
- e.g. $f(x) = 2x^3 - 7x^2 + 4x - 4$.

Use the factor theorem to show that $(x - 2)$ is a factor of $f(x)$.

$$f(2) = 2 \times 8 - 7 \times 4 + 4 \times 2 - 4 = 0$$

$\therefore (x - 2)$ is a factor of $f(x)$

Scan the paper.

- You can do the questions in any order. Start with all the familiar questions first. There may be questions that look unfamiliar. Do them last.

Read The Question

- Read the question after you've finished it, to check you've done what it asks you to.

(c) Substitute $x = \frac{1}{10}$ into your binomial expansion from part (a) and hence find an approximate value for $\sqrt{2}$. Give your answer in the form $\frac{p}{q}$, where p and q are integers. (2)

Write on the exam paper

You can write on the exam paper. Draw diagrams to help you (e.g. area under a graph)

Do a sketch for those questions that involve tangents and normal. Don't try to hold the information in your head. If in doubt, sketch it out.

Write in black ink only. Don't use Tippex or highlighters as your answer paper is scanned.

Attempt every part of every question

If you can't do part (a) don't give up. Make up a value for your answer to part (a) and then use it in subsequent parts of the question to earn method marks.

Improve Levels of Accuracy

Always write the full calculator display down first.

Then check the level of accuracy required in the question.

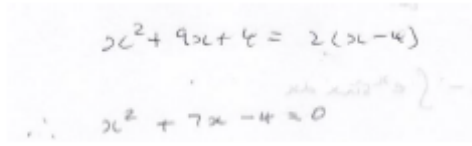
Assume 3 significant figures if no accuracy stated.

Always use unrounded answers in any subsequent calculations.

Remember $g = 9.8$

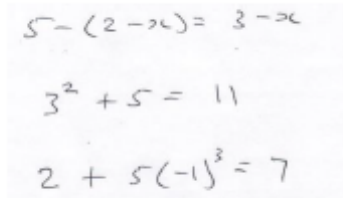
Beware of taking shortcuts with your working.

It doesn't take that long to write out an intermediate step.



Handwritten algebraic working showing a factorization error. The first line is $2x^2 + 9x + 4 = 2(x-4)$. The second line is $\therefore x^2 + 7x - 4 = 0$. A bracket on the right side of the second line indicates that the second line is derived from the first, which is incorrect.

Avoid basic arithmetic and algebraic errors.



Handwritten arithmetic errors. The first line is $5 - (2 - 3) = 3 - 3$. The second line is $3^2 + 5 = 11$. The third line is $2 + 5(-1)^3 = 7$.

Check your work

In many questions, it's possible to take your answer and substitute values back in to the question

Know your Calculator!

Angle units

Pure – radians unless you see the degrees sign $^\circ$

Mechanics – normally degrees

Use brackets to tell the calculator the order of operations.

Use all the functions

- Statistics (mean, standard deviation)
- Distributions (Normal, Binomial)
- Solving quadratic equations
- Solving simultaneous equations
- Integration & Differentiation

Write in the correct space

- Write within the space given for each question. Don't do question 5 in question 6's space as the papers are scanned in question by question. If you need additional paper ask for some. Label parts of questions clearly (a), (b), (c) etc.

Timing

- Don't spend too long on one question.
- Keep a close eye on the time.
- Put a watch on your desk rather than keep looking at the clock on the wall.
- Make sure you know how many marks for each question and aim for a minute per mark.

Use the correct notation

Integration

$$\int \sin^2 x \, dx = \frac{1}{2}x - \frac{1}{4}\sin 2x + c$$

$$\text{NOT } \int \sin^2 x = \frac{1}{2}x - \frac{1}{4}\sin 2x$$

Differentiation

$$y = 3x^2 \quad \therefore \frac{dy}{dx} = 6x$$

$$\text{NOT } \frac{d}{dx} = 6x$$

Formulae

- Learn the formulae.
- Quote the general form first then substitute in the correct values.

$$\text{e.g. } \frac{d}{dx} \left(\frac{f(x)}{g(x)} \right) = \frac{f'(x)g(x) - f(x)g'(x)}{(g(x))^2}$$

$$\frac{d}{dx} \left(\frac{e^{2x}}{\sin x} \right) = \frac{2e^{2x} \sin x - e^{2x} \cos x}{\sin^2 x}$$