

Grade Grabber 12

40 Mark Paper

Question 1

Expand and simplify; $(x + 4)(x - 3)(x + 3)$

Classic Blunder : Not spotting the difference of two squares.

[3 marks]

Question 2

Factorise fully; $24e^4g + 32e^3g^5$

Classic Blunder : Not knowing what the word “factorise” means.

[2 marks]

Question 3

Tracy journeyed by train from Shrewsbury to London.

The train travelled a distance of 264 km.

The time taken was 2 hours 45 minutes.

Work out the average speed of the train in kilometres per hour.

Classic Blunder : Thinking 2 hours 45 minutes is 2.45 hours.

[3 marks]

Question 4

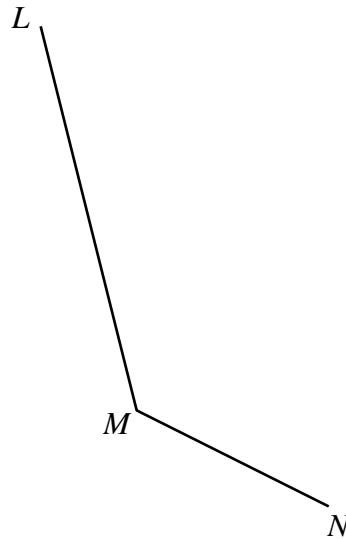
Show that $2 - (x - 2) \div \left(\frac{x^2 - 4}{2x + 3} \right)$ can be written as $\frac{a}{x + b}$
where a and b are integers.

Classic Blunder : Not sorting out the division using KOF as the first step
It's all about BODMAS !

[5 marks]

Question 5

Use ruler and compass to construct the bisector of obtuse angle LMN
You must show all your construction lines



Classic Blunder : Not having a ruler and compass.

[3 marks]

Question 6

Solve; $x^2 - 3x - 18 = 0$

Classic Blunder : Not immediately factorising the quadratic,

[3 marks]

Question 7

Morgan, Lucy and Fadi share some money in the ratio 2 : 5 : 3

Lucy gets £26 more than Fadi.

Work out the total amount of money that was shared out between the three people.

Classic Blunder : Not reading the question carefully.

[4 marks]

Question 8

A rectangular lawn has a length of $5x$ metres and a width of $2x$ metres.
The lawn has a path of width 1 metre on three of its sides.

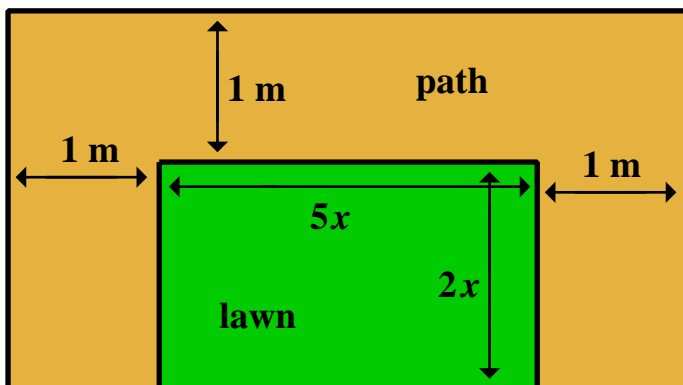


Diagram NOT
accurately drawn

The total area of the lawn and the path is 60 m^2

(i) Show that $10x^2 + 9x - 58 = 0$

Classic Blunder : Not realising the total area of 60 must equal $(5x + 2)(2x + 1)$

[3 marks]

- (ii) Calculate the area of the lawn.
Show clear algebraic working.

HINT : You could use FACT 58 on your calculator to help guess the brackets
or simply use the formula to solve quadratic equations

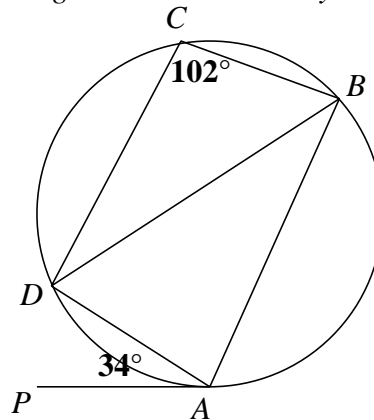
i.e. $ax^2 + bx + c = 0$ has solutions $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Classic Blunder : Not doing part (b) because you couldn't do part (a)

[4 marks]

Question 9

Diagram NOT accurately drawn



A, B, C and D are points on a circle

PA is a tangent to the circle, angle $PAD = 34^\circ$ and angle $BCD = 102^\circ$

Calculate the size of angle ADB

Give a reason for each stage of your working

Classic Blunder : Not using the Alternate Segment Theorem.

[5 marks]

Question 10

The curve with equation $y = 28x^2 + \frac{7}{x}$ has one stationary point.

Find the coordinates of this stationary point.

Show your working clearly.

Classic Blunder : Not knowing that a stationary point is a point with gradient zero.

[5 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk