Worked Solutions

2012

BMAT
CRASH COURSE

2012 – Section 1: Worked Solutions

1. 10% of the population is 860,000, so we can cross out B, C, E and F. 20% of the area is roughly 26,000/5 = just over 5000. So out of A and D, D is a much better option, as it is definitely more than 20% of the area.

We're not interested in exact figures here - the key is to eyeball the numbers and estimate the answers to the calculations.

2.

A) Pale-skinned people need more exposure to sunlight. - The word "need" immediately suggests that this isn't the right answer. In fairness, we could (at a stretch) convince ourselves that this is true, but let's look at the other options before jumping to conclusions. As it so happens, there is a better answer than this.

B) Vitamin D can best be obtained by exposure to sunlight - Again, somewhat true, but not the right answer. The question asks what the main conclusion of the passage is - this point about sunlight is just a statement used to back up the main argument.

C) Pale-skinned people should be recommended to take vitamin D supplements - this is clearly the correct answer. The passage even says that "Based on these findings, pale-skinned people should be added to the list of those for whom vitamin D supplements are recommended by the government". The phrase "based on these findings" is indicative of a conclusion, which is what we're asked about.

D) Longer exposure to sunlight increases the risk of skin cancer - irrelevant

E) People with very dark skin have a higher need of vitamin D supplements than pale-skinned people - Nothing in the passage about a comparison between pale and dark skinned people. Besides, the sweeping nature of the statement suggests it's wrong anyway.

BOLD STATEMENT THEOREM

With a lot of the critical thinking questions, you can eliminate a lot of answers based on the "bold statement" theorem - if the statement uses emphatic language (such as the word "need" or "never") or deals in absolutes, or makes a sweeping generalisation, it is likely to be false. Of course, there are a few circumstances in which doesn't apply, but use your discretion when dealing with those.

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3. The process of elimination works for this question. We basically want to try out each option and see if the criteria in the question is satisfied. So the process is to go through each of the tiles one by one, and eliminate it as an answer if the number of each type of tile isn't identical if we exclude that particular

one. That's a bit of a mouthful, but let's go through each of them:

A - if we get rid of A, and count up the number of different patterns, we find that the solid black ones add up to 6, but the solid whites add up to 4. We went with black and white because they're the easiest to see. So from this, we know that A can't be the right answer.

B - eliminating B gives us 5 black patterns but 6 white ones. Therefore, B can't be the right answer.

C, D, E - eliminating each of these tiles gives us the wrong number of some of the patterns.

F - eliminating F results in 5 blacks, 5 whites, 5 dots, 5 lines, and 5 checkers. This looks like the right answer. Shame it had to be the last one on our list, but the whole process of elimination shouldn't have taken more than 2 minutes which is what we can allow ourselves per question.

4. Simply by applying the Bold Statement Theorem we can see that the answer has to be B. A is wrong because although it's true, it's not the fundamental message of the passage. C is obviously false because of the word "never". D is factually wrong - if anything, electrical engines would reduce CO2 emissions.

5. This is tricky. Well, not tricky, but tedious. The easiest way to work it out seems to be to work out the total area of the garden, and then to subtract the areas of the pond, veg, shrubs etc.

Total area = 18 x 12 = 216.

Shrubs: (3+1+1+1+0.5 = 6.5, 18 – 6.5 = 11.5). 11.5 x 4 = 46 m^2 of shrubs.

Lawn + Pond: (1+1+1=3, 12-3 = 9). 9 x 3 = 27 m^2 of lawn+pond.

Veg: same length as shrubs, minus 0.5 , so 11.5 – 0.5 = 11. 11 x 3 = 33m^2 of veg.

46 + 27 + 33 = 106m2. 216 – 106 = 110m^2. 1 m^2 requires 4 stones, so 110 x 4 = **E - 440**.

This appears to be a reasonably quick solution (ie: under 2 minutes). Another option would have been to add up each area individually, but that would be a waste of time – we want to exploit the presentation of information in the question as much as possible to save time. That's why putting lawn and pond together makes sense, as does recognizing the veg is just slightly less than the shrubs in width etc.

6. Questions asking about flaws in arguments are very common in the BMAT, and indeed, in all critical thinking exams. The trick is to work out what the CONCLUSION of the argument is, and then go through all the options to find the best FLAW. So let's do just that.

Conclusion: If parents spend time discussing these issues with their children, they will help their children read well.

How do we know this is a conclusion? Firstly, it appears at the end of the passage, which is a dead giveaway. Secondly, it's prefaced by "discussing news and serious issues showed the strongest correlation, SO" – they keyword here being "so" which suggests a conclusion is coming up. But to be perfectly honest, it's very clear from reading the passage that that is indeed the conclusion, so you

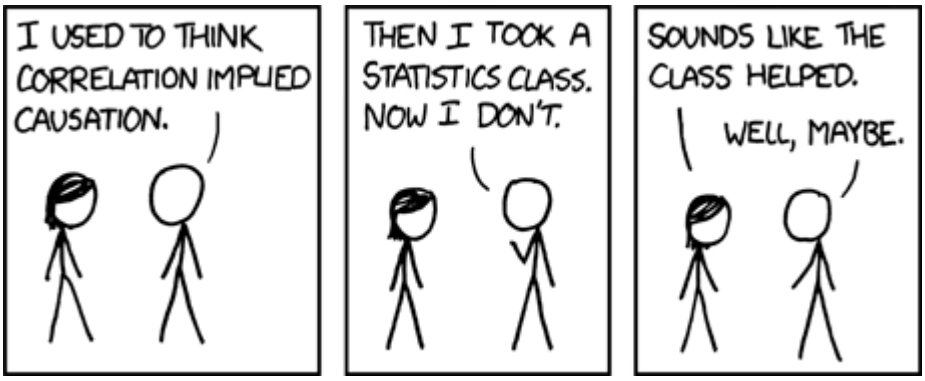
don't need to think too deeply about what the characteristics of said conclusion are. Anyway…

A – Nothing to do with the conclusion

B – Sounds like a feeble attempt at coming up with a flaw. We have our own way of dealing with assumptions (the point will be made later when relevant to a particular question), but suffice it to say that this is clearly not the best flaw in the argument.

C – Somewhat true. But not an inherent flaw in the argument, as it has little to do with the conclusion. If the question were asking about statements that WEAKEN the argument, then perhaps (just perhaps) this might be reasonable, assuming of course that there are no better options
D – Nothing to do with the conclusion.

E – The perfect answer. The conclusion does indeed suggest a causal relationship between discussion and reading, based on the statistics (ie correlation). And, as we all should be aware, **correlation does not necessarily imply causation.** And for the purposes of the BMAT, correlation almost NEVER implies causation.

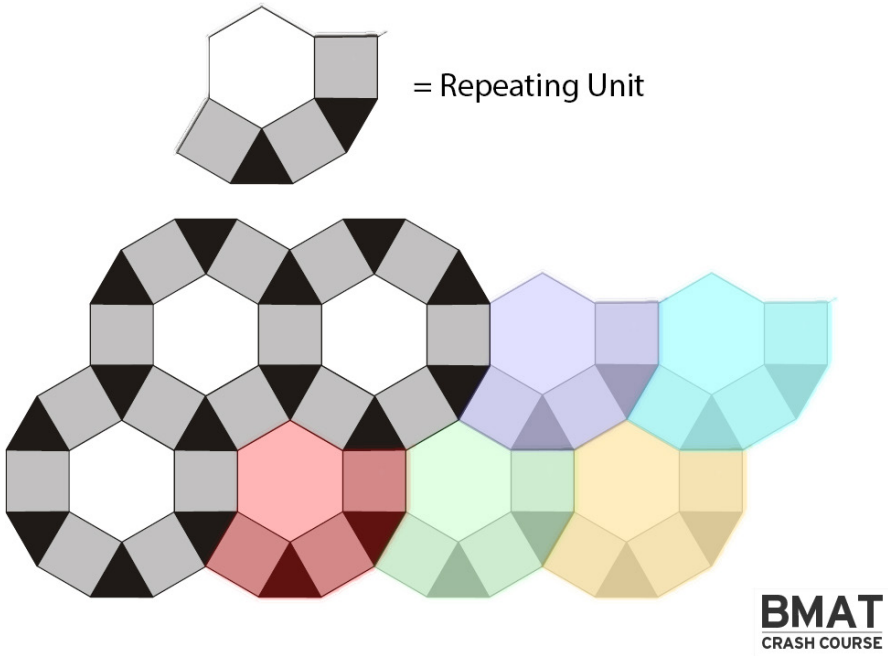


(It took me a while to get the joke)

7. This was really hard. I would have taken a look, marked it for consideration later, and forgotten about it until the end.

The method for a pattern-related question like this is to work out what the repeating unit of the pattern is. The image shown in the question is very deceptive, in that it somehow suggests to the naked eye that the pattern involves a hexagon combined with the squares and triangles around it, but this isn't actually the case when you consider the various degrees of overlap.

Instead, the way to identify the actual repeating unit (in this case) was to see which parts of the image shown don't overlap with anything. You can see the result highlighted in red in the image below. It was a matter of realizing that you could repeat the pattern to infinity as long as you had that repeating unit. And that repeating unit consists of **1 hexagon, 3 squares and 2 triangles = A.**



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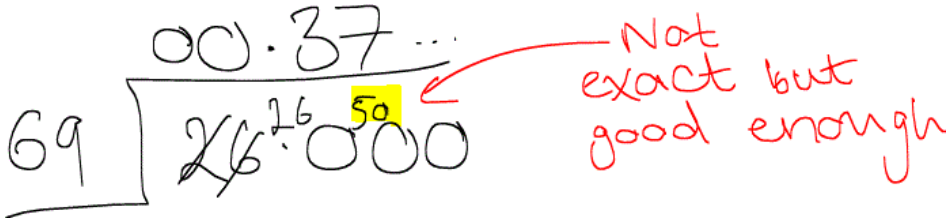
8. Fairly standard data handing question. We had 11,549 + 30,432 = 42,000 patient days, and 3 cases over those patient days. We want a rate per 100,000 patients, so we need to multiply 3 by roughly 2.5, which gives us 7.5 ish. The closest answer is therefore **C – 7.15**.

9. Again, standard adding up of numbers. We're looking at the number of cases in 2009. Organisation 3 has easily the largest number of cases, so that's the one we're interested in. If we go down the column and mentally add up the total number of cases we get to 69.

So our sum is 26/69 and that should give us the right percentage. The question is, how do we do that without resorting to long division or a calculator? Well, we know that it can't be 33% because 26x3 > 69, and therefore, it can't be A or B (17% or 26%) either. So we're torn between 38% and 44%.
If your mental maths is good then you can probably guess that 38% is the closer answer, but if you want to make completely sure, you can use short division to check (as shown below).



10. Time for some more mental maths. Organisation 2 had 16,163 (ie: 16,000) patient days over 11 months, so (16,000/11) 1500 patient days per month, so (16000+1500) 17,500 patient days in the whole year.

So we've got 1 case out of 17,500 patient days. We need to get a figure out of 100,000 days to get the answer. 100/17.5 = more than 5 but less than 6. So we can rule out C, D, E.

Is the answer closer to (A) 5.28 or (B) 5.67? 17.5 x 5 = 87.5, requiring 12.5 to get to 100. 12.5 is more than half of 17.5, so 100/17.5 must be over 5.5. The answer is therefore **B – 5.67**.

11.

A) CdI is more likely for patients in large hospitals – As compared to what? If we're comparing with all the others, then there isn't enough data from the others to make a valid comparison.

B) CdI is more likely for patients in small hospitals – We only have 1 piece of data from a small hospital alone, so we cannot reliably conclude this. Besides, that small hospital had 0 cases in 2010, so there's no way this can be right.

C) There were more cases of CdI in large hospitals than small ones in 2010 – not necessarily. When an organization has both large and small hospitals within it, we don't know which of them the cases fell into. It is entirely possible that all 25 cases in organization 3 came from small hospitals, along with all 12 cases in organization 11 etc – thus, we cannot reliably conclude that there were more cases of CdI in large hospitals.

D) CdI occurs in all four types of hospital – we don't have any instances of DC and TC hospitals on their own to verify that CdI actually occurred within them, so again, it is entirely possible that in organization 5 (DC, TC) all the cases were in TC, which would mean DC didn't have any cases, which renders the conclusion invalid.

E) None of the above statements – "When you have eliminated the impossible, whatever remains, however improbable, must be the truth" (Sherlock Holmes)

12. At first glance, there seems to be an awful lot of data here, but thankfully we can ignore most of it. Nicola wants to take the first bus from the airport on Thursday, which would be the 09:15. It takes 50 minutes to get to town, so she arrives at 10:05.

She wants to be back at the airport by 17:00 so she needs to take the bus at 16:10 or earlier. The only bus she can therefore take is the 15:20. If she got to town at 10:05 and left at 15:20, she has 5 hours and 15 minutes, so the answer is **B.**

Don't be put off when you see tables with lots of stuff in them. Most of the time, you will only have to focus on a very small portion of that table, and the rest is just there to annoy you.

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13. Even without reading the passage, we can tell straight away that the answer is **D**, thanks to the bold statement theorem.

In any critical thinking question, always read the possible answers before reading the passage. Even if you don't get an answer straight away with the bold statement theorem, you'll still have a better idea of what you're looking for in the passage itself.

A The melting of the Arctic ice is the **only** explanation for the UK's unusual weather – the word "only" makes this a bold statement which we can instantly dismiss.

B If the Arctic ice were not melting the UK **would not have** experienced this unusual weather – not as bold as the previous statement, but still pretty bold. It's stating pretty emphatically that the UK **would not have** experienced unusual weather, which isn't necessarily true, and not what the passage is saying ("… is what one would expect"). Let's try and find a better option.

C The melting of the Arctic ice **must** have caused the unusual weather in the UK – freebie: the word "must" effectively eliminates this as a reasonable answer.

D The unusual weather in the UK could have been caused by the melting of the Arctic ice – there we go. This is a nice statement in that it's not overly bold, it just states a possible cause of the effect, which is very reasonable. And if you were so inclined to read the passage, it's pretty much what the first sentence says.

14. I hate questions involving nets of shapes with a passion. I still remember in the Year 6 SATs when there was a question about the net of a cube, and with a huge amount of time left, I resorted to ripping my rough paper with a ruler to make the nets and tried to physically fold them into cubes, but I digress. There's no real "method" to solving these questions. The only thing you can do is visualize how the net will fold up and hope that you've done it properly. You could even draw out a cube and label the sides with the appropriate shapes. If it all works out, the answer should come out to be **D**.

We can eliminate A and B because the triangle is "pointing" to the short end of the solid line, when in fact, if we look at the net, it should always be pointing to the long end of the solid line. I can't think of an immediately obvious way to eliminate any of the others, short of actually visualizing it, which is what you have to do anyway.

15. This is a WEAKEN question. To solve these, we first need to identify what the argument in question actually is, and we do that by finding the conclusion of the passage: "So parents of children with autism are damaging their children's health by using the sprays". That is what the author is arguing, and everything else is just background/reinforces that argument. So our objective is to find out which statement (if true) best weakens the argument

A Some studies reveal that oxytocin can stimulate feelings of envy – envy is bad. If anything, this would strengthen the argument that parents are damaging their kids by using oxytocin sprays.

B The scientific studies of oxytocin have never used children as subjects – again, if anything, this strengthens the argument. If studies have never used children as subjects then it's further evidence that parents are potentially damaging their kids by using the sprays.

C The amount of oxytocin in the sprays sold online is too low to have any effect in children – **this weakens the argument**. If the amount of oxytocin in nasal sprays is too little to have any effect, the claim that parents are damaging their kids because of the spray becomes less valid. This seems like a solid option to go for, but let's quickly take a look at the others just to make sure.

D The effects of oxytocin on individuals vary depending on the type of culture they live in – this might be somewhat relevant to the argument, but depending on whether the "effects" are positive or negative, it could either weaken or strengthen the argument, and therefore, isn't the best answer.

E Oxytocin reduces trust and co-operation in people who are anxious and sensitive to rejection – this, again, strengthens the argument by reinforcing the idea that oxytocin is bad.

16. This is nice and easy. It literally just involves counting squares. You can save a lot of time by realizing that you don't need to worry about the entire conservatory – just 1/6th of it, as it's made up of a repeating pattern. If we focus on the top left corner, we see that there are 25 big squares, and therefore 100 small squares (4 small squares within each big square, which can be white or black). If we count the number of small black squares in the "large square" border, we get 28. Then we just add the other black squares which totals 44. 44/100 = **(C) 44%**.

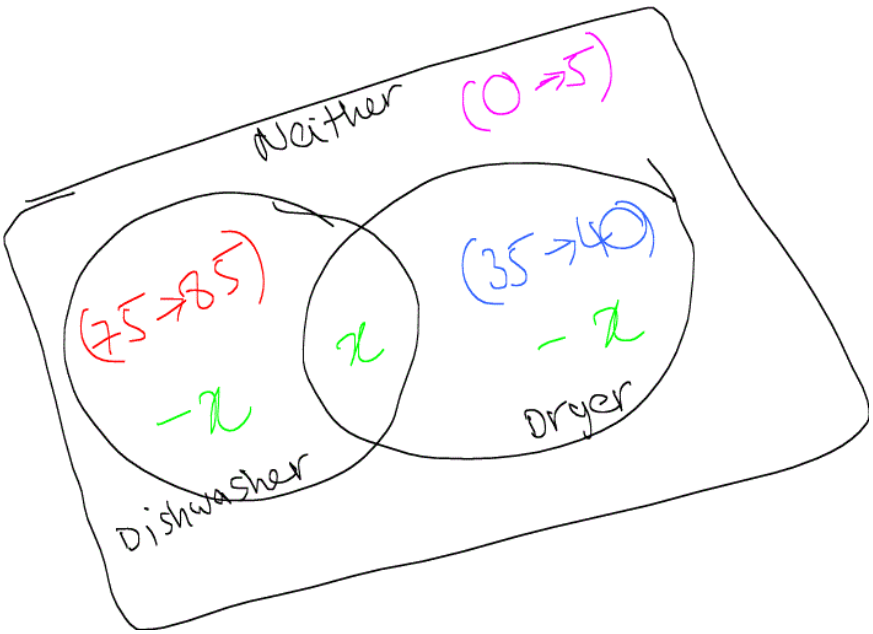
17.

1) Improved staffing levels in hospitals at weekends **would** reduce death rates – bold statement. The passage does not say that reduces staffing levels CAUSES an increased death rate, it merely suggests that "this [as well as lower availability of specialist services] may be contributing to the increase in mortality".

2) Weekend provision of community and primary care services should be enhanced – on the surface, this seems like a reasonable conclusion. However, if you read the passage carefully, you'll find that it only mentions weekend provision of community services as an explanation for the increased mortality rate – that patients are dying in hospitals rather than at home (implying that they're going to die anyway) but because they're dying in hospitals, the statistics show an increase in mortality. Enhancing weekend provision of community and primary care services wouldn't (if we're going by only what the passage says) actually help anything, it could just lower the statistics.

3) Fewer patients should be admitted to hospital at times when staffing levels are low – another bold statement which assumes low staffing levels cause patient deaths, which is not what the passage is explicitly saying. Therefore, we can't draw this as a conclusion.
The answer has to be **G – none of the above statements**.

18. The Venn diagram is a tool that we all learn in primary school, and yet seldom use. This is an instance in which it is very helpful.



The arrows represent the range of figures that could be in that section. "(75→85) – x" represents "75

to 85, take away x" where x is the number in the middle (ie: people who own both a dishwasher and a tumble dryer).

Everything must add up to 100 (obviously). So:

(75→85) – x + (35→40) – x + x + (0→5) = 100. Rearranging this gives:
X = (75→85) + (35→40) + (0→5) – 100

We want to find the smallest and largest value that X could take.
Largest: X = 85 + 40 + 5 – 100 = 30
Smallest: X = 75 + 35 + 0 – 100 = 10

Therefore, the answer is **A – Between 10% and 30%**

19. Lots of data, but again, only a little that we actually care about. Scanning the bullet points tells us that there were 2.23 million category A calls. The bullet point below says that 74.9% of these were answered in time, which means 25% weren't. 25% of 2.23 is just over 0.5, so the answer is **B – 0.56 million**.

20. The bullet point we referred to earlier tells us that category A was (roughly) 33%, B was 40% and C was 27% (the remainder). So we're looking for a pie chart that shows A as being 1/3 of the total chart, and C being just over 25%. The only chart that fits this bill is **D**.

21. We just go through each of the statements and see if it makes sense and is reasonable.

A 1.47 million calls were not responded to within either 8 or 19 minutes – this shouldn't affect the number that were transported or treated at the scene.

B 1.47 million calls did not result in an emergency response – this sounds reasonable. Let's look at the others just to make sure there isn't a better option.

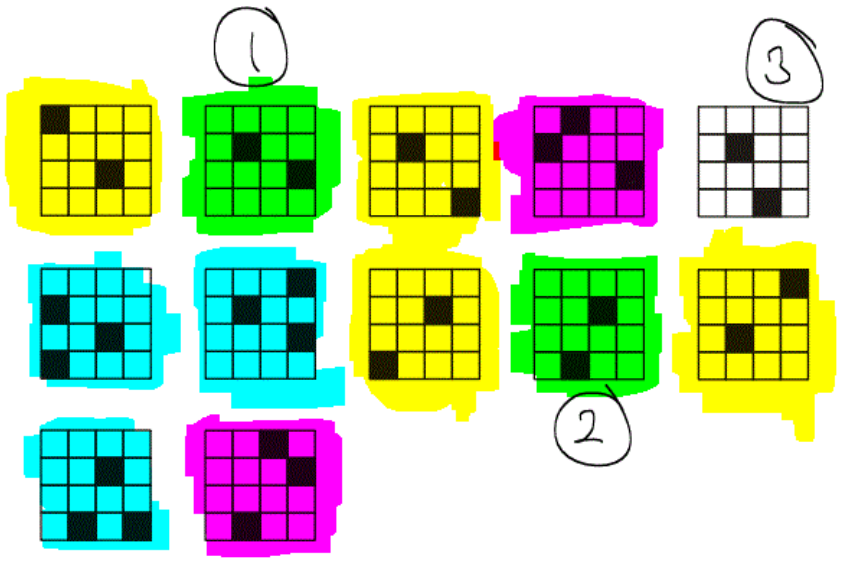
C 1.47 million calls were not genuine emergencies – Bold statement, and not as good an answer as B. Besides, whether or not something is a "genuine emergency" doesn't necessarily dictate whether there was a response to it.

D 1.47 million calls were category C, not requiring a response – 27% of calls were category C, and 27% of 8 million is around 2 million, not 1.47, so this can't be right. In addition, category C calls may require a response (it's just the timing that changes) so this is wrong on another count.

22. We established in Q19 that 75% of the 2.23 million category A calls in 2011 resulted in a timely response. In 2010, there were 2.08 million category A calls, of which 74.3 (ie 75%) were answered in a timely fashion. Because 74.9% and 74.3% are practically identical, all we have to do is work out the difference in the total number of calls. 2.23 – 2.08 = 0.15. There were 0.15 million more calls in 2011, which means that of those, 75% were responded to within 8 minutes, so 0.75 x 0.15 = just under 0.12, so the answer is **A – 0.12 million**.

23. It's fairly obvious that there 4 or more patterns here. The first 3 are easy ; yellow, blue and purple (shown below) have very different patterns. The green and unshaded squares are slightly more problematic. If we compare 1 and 2, we see that they do indeed have the same pattern (rotating 1

clockwise results in 2), but 3 has a different pattern to the two of them (comparing 3 to 1 shows that the top block is shaded in the same place but the bottom one isn't – that must therefore be a different pattern). This totals 5 patterns, so the answer is **B – 5**.



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24. This is a STRENGTHEN question, and just like "weaken" questions, we need to identify what the conclusion of the passage is before we can work out what best strengthens it. This time, the conclusion is the very first sentence (rather than the last, as it usually is) – "Police should be given clear permission to use water cannons against rioters and rules about when it is appropriate".

A) Using water cannons would negatively affect the innocent as well as the guilty – hardly an argument in favour of the police being given permission to use water cannons.

B) Using water cannons does not require special training and resources – doesn't really add much to the argument. Since when has the police had against anything against requiring training?

C) Water cannons are no more effective at dispersing rioters than tear gas or rubber bullets – Weakens the arguments rather than strengthening it. If water cannons are no more effective than others, why should we give the police clear permission to use them?

D) Water cannons cost more than £1m each and need to be deployed in pairs – weakens the argument on the basis of cost.

E)A survey of 2000 people carried out recently indicated strong public support for water cannons – Although we don't know the circumstances of this survey (who the 2000 people are etc), it's still the best answer as it does slightly strengthen the argument that the police should be using water cannons.

25. We could make a table outlining all the possibilities and count up the different scores we could get, but that would be tedious. A shortcut would be the following method:

Recognise that the highest possible score is 18, and the lowest possible (excluding 0) is 2. We therefore have 17 plausible scores. So now the task is to see which of those are actually possible within the game.

2: 2 + 2 = 4, then miss = 2
3: 2 then miss = 1 + 2 =3
4: 6 + 2 = 8, then miss = 4
5: 6 + 4 = 10, then miss = 5
6: 2+2+2
8, 10, 12, 14, 16, 18 can all be made by adding combinations of 2,4 and 6.
7: 6, then miss = 3 + 4 = 7
9: 6, then miss = 3 + 6 = 9
11: impossible
13: impossible
15: impossible
17: impossible

An even quicker method would have been to realize that all even numbers are possible, and that odd numbers greater than 9 are not, which gives us a total of **C – 13** possibilities.

26. The reasoning given is "art is copying, forgery is copying, so forgery is art". I love errors of reasoning. They're so much fun. This one is quite easy. It's just a case of comparing each of the options with the statement and seeing which one matches.

A) Water is liquid and liquid is fluid, so water is a fluid – this is very reasonable.

B) Petrol is flammable and volatile, so everything volatile is flammable – this is not true, but not what the passage is saying.

C) Being overweight is unhealthy so maintaining the right weight is healthy – this is quite reasonable. Just as a matter of interest, "transposition is a valid rule of replacement that permits one to switch the antecedent with the consequent of a conditional statement in a logical proof if they are also both negated" (Wikipedia). Basically, from the statement "A implies B", one can reasonably infer the statement "not-A implies not-B". So because being overweight is unhealthy, being not-overweight (ie a healthy weight) is not-unhealthy (ie healthy), so this answer makes logical sense.

D) The French are European and Spaniards are European, so the French are Spaniards. This is the right answer. It's obviously nonsense, and effectively what the passage is saying when it says that art is copying, forgery is copying, so forgery is art. This is a fallacy of reasoning because the set "European" is broad and encompasses a lot of subsets (such as "French" or "Spaniard"). However, just because both "french" and "Spaniard" are members of the set "European", does not necessarily mean that "French" is itself a member of the subset "Spaniard".

27. This is a case of starting the most recently, and following the money trail back to its source. We have 2 important pieces of information. (1) No sales were made during May and June, and (2) it takes 3 months to pay the price of furniture, with the first month paying half, and the remaining two a quarter each.

Jan	Feb	Mar	Apr	May	Jun
			4000 →	2000 →	2000

We can fill out this table to work out where the money is coming from. $2000 was made in June, and

because no furniture was sold in May or June, we know that that $2000 must be from the final payment of furniture sold in April. So if that $2k is a quarter of the total amount, that particular piece of furniture must have paid $2k in May as well, but $4k in April. (That 2k could have been 4 lots of 500, or 2 lots of 1000, or whatever – it doesn't matter, as the total money is all we're interested in. Therefore, we might as well use the biggest numbers available to avoid unnecessary maths).

Jan (9k)	Feb (3k)	Mar (4k)	Apr (5k)	May (3k)	Jun (2k)
4000 →	2000 →	2000	4000 →	2000 →	2000
5000	1000	2000 →	1000 →	1000	

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We can then fill out what's been highlighted in yellow. To reach a total sales of 3k in May, we must have had 1000 from furniture that sold in March. That means we can put down 1000 in April (same amount) and 2000 in March (double that amount). April sales add up to 5k, which works with what we've got, so we don't need to account for any more money.

March adds up to 4k, so we need another 2k (green highlighting), so we need another 2k in Feb and 4k in Jan. To make the remaining columns (Jan and Feb) add up, we need the money highlighted in red. Importantly, the money in red cannot have come from furniture sales that year, as the money from a sale is fully collected 3 months after it's bought.

So the total value of the furniture sold between Jan and Jun adds to **C - $20,000**.

28. For this question, identifying the conclusion alone ("the ski holiday industry doesn't damage the environment") isn't enough. We actually need to read the reasons given to support this conclusion, and then identify whether the 3 statements identify weaknesses in any of the arguments.

1) The fact that all travel damages the environment does not prove that the ski holiday industry does not damage the environment – this is indeed a weakness in the argument. The "this is nonsense" comment seems to imply that the ski holiday industry does not damage the environment. The grounds for believing this are that all travel damages the environment. One cannot reasonably make a link between the two, which is why this option identifies a weakness.

2) 26% of a ski resort's energy consumption may be a high amount of energy compared with other types of resort – this is a reasonable comment to make, and is also a weakness in the above argument. The passage is trying to argue that ski resorts use less energy than other holiday industries, but quotes a percentage rather than an actual value. And as the option rightly says, the actual value of energy consumption might be pretty high.

3) The ski holiday industry may damage the environment in ways unrelated to the level of energy consumption – this is also a weakness of the argument. The passage is arguing in favour of ski resorts purely on the grounds of energy consumption, but fails to consider that environmental damage can be caused in ways unrelated to energy consumption, as the option rightly says.

All the options identify a weakness in the argument, so the answer is G.

29. Total ticket sales were 12240. Let's call the total number of sales x.

(20x represents £20 per ticket sale, and the 0.4x represents 40% of the total ticket sales.

£5 was refunded for 40% of 680 tickets. So
The answer is therefore **C - £1360**.

30. This is an ASSUMPTION question. We need to identify what the conclusion of the argument is, and look at the points offered to back that up. We then need to go through each of the options and see whether that information is necessary to go from the point to the conclusion.

For example, "The Quran is the word of God, and so the Quran is infallible". The assumption here is "The word of God is infallible", as that is information that is required in order to go from the argument to the conclusion.

Conclusion: "The public needs to know what weight they should put on these articles when they are assessing evidence from various sources".

Argument: "Authors of articles on health and medical treatments may be sponsored by pharmaceutical companies"

Let's analyse the 3 options:

1 - Authors who receive fees from pharmaceutical companies give a one-sided view of the effectiveness and safety of new medical treatments – The passage says nothing about one-sided views, effectiveness or safety. This cannot be an assumption because it is not information that's needed to go from the argument to the conclusion. Besides, "authors give a one sided view" is a fairly bold statement, so it seems wrong.

2- Companies that sponsor authors of articles on medical treatments aim to influence the content of the articles – Again, the passage says nothing of the sort, and doesn't even assume this. All it is saying is that we should declare conflicts of interest so that we can make informed decisions. And again, this is too bold and too cynical a statement to feasibly be the correct answer.

3- The reliability of articles on medical treatments cannot be fairly judged without information about sponsorship by pharmaceutical companies – this seems very reasonable. It links the argument and the conclusion nicely. And as "none of the above" isn't an option in the answers, we know this must be right, having eliminated the previous two. Finally, this is the least bold statement, as "cannot be fairly judged without information…" is a reasonable statement to make.

The answer is therefore **C – 3 only**.

31. What can we infer from the passage?

- The person in fourth place must have 7 points less than Jill, if he is to finish last regardless of the outcome of this round. This is because even if he gets 6 points in this round, he needs to come last and there are no ties, so he must be 7 points behind. Why can't he be more than 7 points behind? Certainly he can, but the question asks us for the highest score possible for him.

- Jill must be 7 points behind second place, for the same reason as above (in round 9)

- Karen and Gemma must have the same number of points (in round 9). Why? Because whichever comes out ahead must be the winner. Worst-case scenario: one of them gets 1 point, the other gets 0 points. The only way to satisfy this condition is for them to have the same number of points.

So now this question is easy. We just have to go through the options (starting from the highest) and see if the scores add up to 90 (the total score in round 9 = 10 points x 9 rounds). We have to remember however, that the question asks about the final score in round 10, so we need to take away 6 from each answer (fourth place gets 6 points in the last round).

E – 23 – fourth place has 23 in round 10, so 17 in round 9. Jill therefore has 24 in round 9, and the other 2 have 31 each. That doesn't add up to 90 (it adds to 103)

D – 21 – fourth place has 21 in round 10, so 15 in round 9. Jill has 22 in round 9, and the other 2 have 29 each. That makes 95 points (still too high)

C – 19 – fourth place has 19 in round 10, so 13 in round 9. Jill has 20, the other2 have 27 each. That adds up to 87, which is close enough for it to be the right answer.

Why don't the points add up to 90? Because in the assumptions we've made above (7 points difference between 4th and 3rd, and 3rd and 2nd/1st) we're not taking into account the discrete score possibilities. We're assuming that any score is possible, when in fact, only certain scores are because of the whole 6/3/1 point limitation. Is this a problem? Well, if this were a Senior Maths Challenge question and we had much more time to do it, then yes, we would have to take the different score possibilities into account and work it out from there. But because this is the BMAT, we only have 2 minutes per question (give or take), and we have multiple choices. We would rather not go about doing it the proper way, so we might as well use a rough method that gives us a good answer to hedge our bets on. As it turns out, the correct answer was **C – 19**.

32. 1930: 7000 people killed, out of 2.3 million vehicles. That's 7/2300. Today: 27 million vehicles, 3180 people killed. So that's roughly 10 times as many vehicles, and half as many deaths. We can think about the 1930 figure as a fraction (10/10 – easy numbers). Numerator = number of deaths, so today, that's 10/2 = 5. Denominator = number of vehicles, so today that's 10x10 = 100. Today's fraction = 5/100. That's 1/20th the size of the 1930 figure, which is 0.05, so the answer must be **A – 0.04**.

Incidentally, it's quite easy to realize that if a fraction has its denominator multiplied by 10, and its numerator multiplied by 2, the fraction is decreased by a factor of 20, so the whole 10/10 and 5/100 thing isn't really necessary. I just included it to show the thought process behind the answer.

33. A lot of these options seem reasonable, but they are already mentioned in the text, so we need to read the article fairly carefully.

A The police do not record accidents where no injuries are sustained – That doesn't mean the roads are getting safer. If anything, it suggests that accidents are being under-reported.

B Cars have become stronger, reducing the chances of injury in an accident – true, but Paul Smith from Safe Speed says "Cars are safer…" so this counts as being part of the text, which means it's not the right answer ("in addition to the reasons given in the text…" says the question).

C The proportion of accidents reported has fallen – Again, that doesn't mean the roads are safer, it could mean that accidents are under reported, a point which is made multiple times in the article.

D Hospital reporting of road accidents has become more accurate – this seems reasonable. The article says that the number killed or seriously injured fell from 1996 to 2004, while hospital admissions remained unchanged. If hospital reporting of accidents has become more accurate, that gives us more reason to trust these figures which suggest that roads are becoming safer.

E Hospitals have become better at saving the lives of severe trauma victims – True, but again, the passage says "paramedics [have become] better trained", so we can't use this as an answer.

34. This is nice and easy. They're just asking for 40% of 319,928. Obviously we need to round up in some way, but the question is how far we should round up. If we take a look at the options, they're all fairly widely spaced. If we were to round up 319,928 to 320,000 we would just be adding 72 to the original figure. If we then work out 40% of 320,000 the error in the calculation isn't particularly big (compared to the gap between the options). That's quite a long winded way of saying that yes, you can safely round up to 320,000. And 40% of 320,000 is 10% x 4 = 32,000 x 4 = 128,000. So the answer has to be **C – 128,000**.

Some questions will be this simple, but it's quite easy to read too much into them and waste time looking for the trick when none exists. If you've got an answer that works, go with it, and come back later to analyse it if you end up with gallons of time at the end.

35. Unfortunately, the bold statement theorem doesn't really apply here, as all 5 of the statements can be viewed as "bold" in some way or another. So we need to consider each of them in turn.

A - The DfT collection method must underestimate the number of deaths and serious injuries – This is a possibility. It would mean that the DfT figures would be lower than they actually are, which is potentially a reason for the discrepancy between hospital and DfT data.

B - The roads are not getting safer – this is clearly ridiculous. "Safer" is far too vague for this to be a reasonable option, and even if the roads are getting safer (ie accidents reducing) that doesn't account for the discrepancy between DfT and hospital figures.

C - Fewer people are being admitted to hospital for minor injuries – If anything, that should mean that the hospital figure decreases, when in fact, it has stayed constant. This therefore can't be the right answer.

D - There has been a decrease in less serious injuries – If that were the case, but hospital admissions remained unchanged, surely the DfT figure would increase. This can't be the answer.

E - The police include accident injuries which do not involve hospitalization – Again, if anything this would make the DfT figures higher than that of the hospital, not lower. Not the right answer.

So, having looked at all the statements, the answer has to be **A**. It is true that the use of the word "must" is reasonably bold, but it is clearly the best statement that potentially explains the discrepancy between the DfT and hospital figures.