

GMAT HACKS Newsletter Explanations: May 9, 2008 (#53)

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1. C

Explanation: Combined, the machines fill one order in 15 minutes. In those 15 minutes, each of the machines fills some fraction of the order. Since we know the time (15 minutes), we need to know the rate of machine X to find the fraction of the order—how much of the job—machine X would fill.

Statement (1) is sufficient: if machine X fills one order in 60 minutes, we can find out how many orders it could fill in 15 minutes—one-fourth as many, or  $\frac{1}{4}$  of an order.

Statement (2) is also sufficient. Using the same technique, we can determine that Y would fill  $\frac{3}{4}$  of an order in 15 minutes, which leaves  $\frac{1}{4}$  of the order for machine X. Choice (C) is correct.

2. C

Explanation: Within the scope of GMAT math, there is no way to simplify  $t^3 - m^3$ , so in order to answer the question, we'll need the values of both  $t$  and  $m$ .

Statement (1) is insufficient. We can factor and find that  $(t+m)(t-m) = 18$ , but that doesn't give us what we need.

Statement (2) is also insufficient. Two variables and one equation isn't enough to solve for the variables.

Taken together, the statements are sufficient. If  $t-m = 2$ , we can substitute that into the factored version of (1):

$$(t+m)(2) = 18$$

$$t+m = 9$$

Now we have two equations and two variables:

$$t+m = 9$$

$$t-m = 2$$

Add the equations:

$$2t = 11$$

$$t = 5.5$$

From there, we can find  $m$  and answer the question. No need to do the rest of the math, and the answer is (C).

3. C

Explanation: Any time you're given a geometry question describing a figure, it's a good idea to draw it. In this case, the diagram shows a triangle formed by OA, OB, and AB, where OA and OB are radiuses of the circle and AB is a chord of the circle.

Statement (1) is insufficient: This tells us that OA and OB are equal to 5, but we don't know how those lengths relate to AB.

Statement (2) is also insufficient. Because OA = OB, triangle OAB is isosceles, meaning that angles OAB and OBA are equal. If AOB is 60, the sum of the other two is 120, which tells us that the triangle is equilateral. Without any lengths, though, we can't find the length of AB.

Taken together, the statements are sufficient. If we know the triangle is equilateral and the length of two of the sides is 5, we know the third side also has a length of 5. Choice (C) is correct.

4. E

Explanation: Statement (1) is insufficient. Distances can be expressed algebraically as absolute values, which means that:

$$|s - 0| = \frac{1}{2} |n - 0|$$

or:

$$|s| = \frac{1}{2} |n|$$

That's not enough; even without the absolute value signs, we would need the value of  $n$  to find  $s$ .

Statement (2) is also insufficient: again, we've got an equation with absolute values. If -4 is halfway between the variables, the difference between -4 and each of the variables is the same:

$$|n - (-4)| = |s - (-4)|$$

$$|n + 4| = |s + 4|$$

Taken together, the statements are still insufficient. It would take far too long under timed conditions to establish the exact values that  $s$  and  $n$  could be, but here's how to think about it. If  $n$  and  $s$  are both negative, they could be equally distant from -4, with  $s$  half as far from 0 as  $n$ . The values would be around, but not exactly 2.75 and 5.5.

If  $n$  is negative and  $s$  is positive, there's also a pair of values that would work. In this case it would be about -16 and 8. No need to know the exact numbers, only that such a pair exists. Choice (E) is correct.

5. C

Explanation: There are several subgroups in the 250 students: mathematics, computer science, or biology only (though the question tells us that no student majors in mathematics only)

any overlap of two of the three subjects (though mathematics and biology only is impossible)

students who major in none of the three

So, 250 is the sum of five subgroups:

$$250 = CS + B + (M\&CS) + (B\&CS) + None$$

We're given one of those values:

$$250 = CS + 90 + (M\&CS) + (B\&CS) + None$$

We're looking for the sum of the two overlaps. To find that, we'll need both the number of CS only, and the number of None.

Statements (1) and (2) are both insufficient on their own, as they give us one of those categories, and not both.

Taken together, they are sufficient. We know all of the subgroups except for the two overlaps:

$$250 = 50 + 90 + (M\&CS) + (B\&CS) + 40$$

$$250 = 180 + \textit{overlaps}$$

$$\textit{overlaps} = 70$$

Choice (C) is correct.