

GMAT HACKS Newsletter Explanations: March 7, 2008 (#46)

For hundreds more practice questions, exercises, and extensive tutorials on every aspect of GMAT Math, be sure to check out the GMAT Math Bible at gmatmathbible.com. You'll also find nearly two thousand more practice questions available at gmatproblems.com.

1. D

Explanation: We're given a rate in envelopes per minute, and we're looking for a rate in envelopes per minute, so let's convert the rate of envelopes per hour to envelopes per minute. One minute is $\frac{1}{60}$ of an hour, so a rate of envelopes per minute will be $\frac{1}{60}$ of the corresponding rate in envelopes per hour:

$$1,080 \frac{e}{h} \left(\frac{1}{60}\right) = \frac{1,080}{60} = \frac{108}{6} = \frac{54}{3} = 18$$

Their combined rate is 18 envelopes per minute. Their combined rate is simply the sum of their individual rates, so if Carolina's rate is 8 envelopes per minute, David's rate must be 10 envelopes per minute, choice (D).

2. B

Explanation: If 116 of the shirts are long-sleeved and 75 percent of those are on sale, that means that $116\left(\frac{3}{4}\right) = \frac{116(3)}{4} = 29(3) = 87$ of the long-sleeved shirts are on sale. That leaves $116 - 87 = 29$ of the long-sleeved shirts that are not on sale. We're looking for the probability that a shirt is long-sleeved and not on sale; there are 29 of those shirts, and a total of 174, so the probability is $\frac{29}{174} = \frac{29}{6(29)} = \frac{1}{6}$, choice (B).

3. C

Explanation: Use even and odd identities to evaluate each expression:

(A) $2(\text{odd}) = \text{even}$

(B) $2(\text{odd})^2 = 2(\text{odd}) = \text{even}$

(C) $n^2 + 2n = (\text{odd})^2 + 2(\text{odd}) = \text{odd} + \text{even} = \text{odd}$

(D) $n^2 + 3n = (\text{odd})^2 + 3(\text{odd}) = \text{odd} + \text{odd} = \text{even}$

(E) $n^2 + 2n + 3 = (\text{odd})^2 + 2(\text{odd}) + \text{odd} = \text{odd} + \text{even} + \text{odd} = \text{even}$

(C) is the only odd answer, so it is correct.

4. B

Explanation: First, evaluate the expression:

$$411 - 219 = 192$$

Next, look for factors of 192. The sum of the digits is 12, so 3 is a factor. $192 = 3(64)$. 64 is a power of 2: $64 = 2^6$, so $192 = 3(2^6)$. 2 and 3 are the only prime factors, so the largest prime factor is 3, choice (B).

5. C

Explanation: Since an equal number of violinists and cellists must play the piece, there are two possible total numbers of performers: there will either be one of each, or two of each.

If there are one of each, there are 6 possible violinists to choose from and 2 possible cellists. That's a total number of groups of $6(2) = 12$.

If there are two of each, there is only one possible group of cellists: the group formed by the two available cellists. To find the number of groups of 2 violinists that could be selected, use the combinations formula, where $n = 6$ and $k = 2$:

$$c = \frac{n!}{k!(n-k)!} = \frac{6!}{2!(6-2)!} = \frac{6 \times 5}{2} = 15$$

Since there is only one possible group of cellists, the number of 2 violinist/2 cellist groups is 15. Add that to the number of one violinist/one cellist groups, and the total number of possible groups is $15 + 12 = 27$, choice (C).