

GMAT HACKS Newsletter Explanations: March 21, 2008 (#48)

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1. A

Explanation: Since both variables are negative, $\frac{x}{y}$ must be positive. We don't know anything about the relative size of x and y , so we don't know which is bigger, which would tell us whether the fraction is greater or less than 1.

I could be true, but it may not be. If x and y are both -2 , $\frac{x}{y} = 1$ and $-x = 2$, in which case $-x$ is greater than $\frac{x}{y}$. However, if $x = -2$ and $y = -\frac{1}{2}$, $\frac{x}{y} = 4$ and $-x = 2$. In this case $\frac{x}{y}$ is greater. This is true any time y is between 0 and -1 .

II could also be true, but again it may not be. To use the same examples from I, if both variables are set equal to -2 , $\frac{x}{y} = 1$, while $xy = 4$. However, if $x = -2$ and $y = -\frac{1}{2}$, $\frac{x}{y}$ is 4 and $xy = 1$. Again, this is true whenever y is between 0 and -1 .

III is also ambiguous. When x is greater than y , such as when $x = -2$ and $y = -3$, $\frac{y}{x}$ is greater. But if the numbers are reversed, say when $x = -3$ and $y = -2$, $\frac{x}{y}$ is greater. None of the roman numerals must be true, so choice (A) is correct.

2. D

Explanation: There are six hours between 6 in the morning and noon. The temperature increased at a constant rate of 3 per hour, so that's an increase of $3(6) = 18$. Added to the initial temperature of 58, the temperature at noon is $58 + 18 = 76$, choice (D).

3. B

Explanation: The \$7 more than Vivian would have paid represents 2% of the price of her purchase—the difference between 6 percent and 8 percent. So, we can find the price of her purchase:

$$0.02p = 7$$

$$\frac{1}{50}p = 7$$

$$p = 7(50) = 350$$

We're looking for what she paid including sales tax. Sales tax is 6 percent:

$$t = 0.06(350) = 6(3.5) = 21$$

The total price, then, is $350 + 21 = 371$, choice (B).

4. E

Explanation: When two terms with the same base and different exponents are added, you can only combine them by factoring. To do so, you may need to simplify each term to see what they have in common:

$$3^{x+1} = 3^x 3^1$$

$$3^{x-1} = 3^x 3^{-1}$$

Since both contain a 3^x , you can factor it out:

$$3^x(3 + \frac{1}{3}) = 3^x(\frac{10}{3})$$

There's no answer that matches that expression, but since a 10 appears in the last two choices, you may be getting warmer. A 3 in the denominator is the same as a 3^{-1} in the numerator, so rewrite the expression:

$$3^x(10)(3^{-1})$$

Finally, combine the two 3's:

$$3^{x-1}(10) = 10(3^{x-1}), \text{ choice (E).}$$

5. E

Explanation: To determine whether a point is on a given line (or line segment, as in this case), start by determining the equation of the line. To do that, find the slope. Given two points, find the difference in y and the difference in x :

$$\text{slope} = \frac{4}{-8} = -\frac{1}{2}$$

The equation of the line will look like this, then:

$$y = -\frac{1}{2}x + b$$

To find the value of b , plug in one of the points and solve:

$$2 = -\frac{1}{2}(-3) + b$$

$$2 = \frac{3}{2} + b$$

$$b = \frac{1}{2}$$

That's the y -intercept, which not only allows you to finish the equation of a line, but also eliminates one of the answer choices. $(0, \frac{1}{2})$ is on the line, so (B) cannot be correct. Our equation of the line is:

$$y = -\frac{1}{2}x + \frac{1}{2}$$

To find the answer, plug in the x value from each choice into that equation, and see if the resulting value of y matches the y value given in the choice:

(A) $y = -\frac{1}{2}(-1) + \frac{1}{2} = \frac{1}{2} + \frac{1}{2} = 1$ - on the line, so (A) is wrong.

(B) Already established as on the line, this is the y -intercept.

(C) $y = -\frac{1}{2}(0) + \frac{1}{2} = \frac{1}{2}$ - on the line, so (C) is wrong.

(D) $y = -\frac{1}{2}(2) + \frac{1}{2} = -1 + \frac{1}{2} = -\frac{1}{2}$ - on the line, so (D) is wrong.

(E) $y = -\frac{1}{2}(4) + \frac{1}{2} = -2 + \frac{1}{2} = -\frac{3}{2}$. If $(4, -\frac{3}{2})$ is on the line, then $(4, -1)$ cannot be. Choice (E) is correct.