SAT2-MATHEMATICS Q&As

SAT Section 2: Mathematics

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QUESTION 1

If the height of a cylinder is doubled and the radius of the cylinder is halved, the volume of the cylinder

A. remains the same.

B. becomes twice as large.

C. becomes half as large.

D. becomes four times larger.

E. becomes four times smaller.

Correct Answer: C

The volume of a cylinder is equal to r2h, where r is the radius of the cylinder and h is

$$\pi\left(\frac{1}{2}\right)^2[2][1]=\pi\ \left(\frac{1}{4}\right)2=\frac{1}{2}\pi\ .$$

the height. The volume of a cylinder with a radius of 1 and a height of 1 is . If the height is doubled and the radius is halved, then the volume becomes

The volume of the cylinder has become half as large.

QUESTION 2

SIMULATION

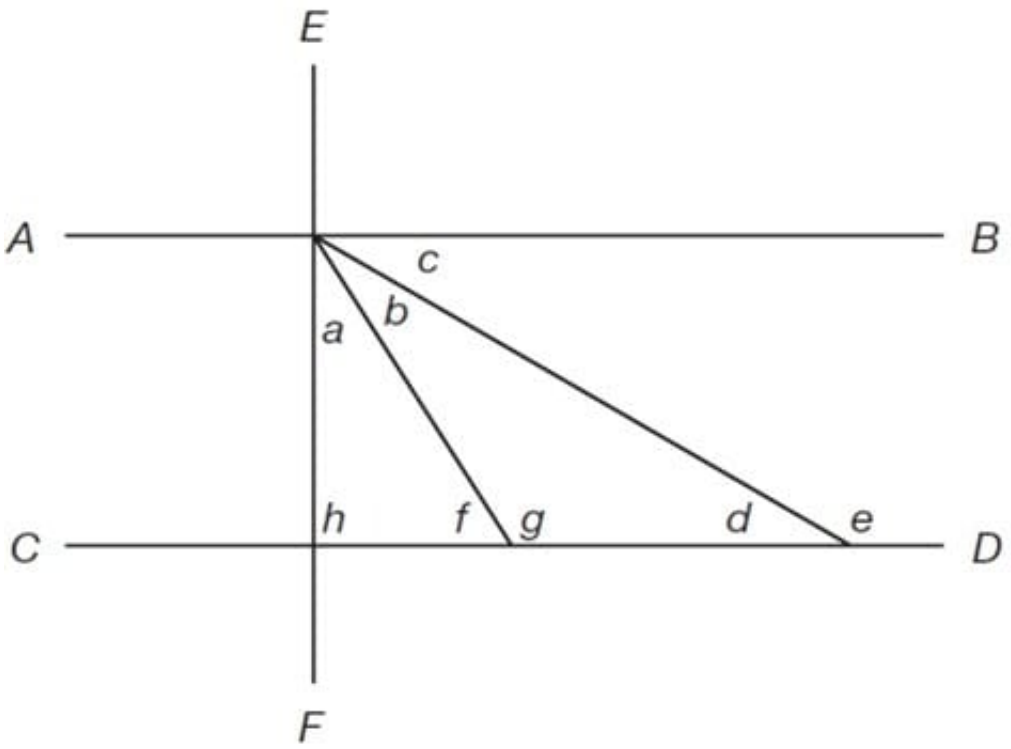
For any whole number x>0, how many elements are in the set that contains only the numbers that are multiples AND factors of x?

A. 1

Correct Answer: A

The largest factor of a positive, whole number is itself, and the smallest multiple of a positive, whole number is itself. Therefore, the set of only the factors and multiples of a positive, whole number contains one element -- the number itself.

QUESTION 3



In the diagram above, if line AB is parallel to line CD, and line EF is perpendicular to lines AB and CD, all of the following are true EXCEPT

A. $e = a + b + 90$

B. $a + h + f = b + g + d$.

C. $a + h = g$.

D. $a + b + d = 90$.

E. $c + b = g$.

A. Option A

B. Option B

C. Option C

D. Option D

E. Option E

Correct Answer: E

Since AB and CD are parallel lines cut by a transversal, angle f is equal to the sum of angles c and b. However, angle f and angle g are not equal -- they are supplementary. Therefore, the sum of angles c and b is also supplementary -- and

not equal -- tog.

QUESTION 4

The function m # n is equal to m2 – n. Which of the following is equivalent to m#(n # m)?

A. $-n$

B. $n^2 - m$

C. $m^2 + m - n^2$

D. $(m^2 - n)^2 - n$

E. $(n^2 - m)^2 - m$

A. Option A

B. Option B

C. Option C

D. Option D

E. Option E

Correct Answer: C

Explanation: M#n is a function definition. The problem is saying “m#n” is the same as “m2– n”. If m#n isn2– n, then n#misn2– m. So, to find m#(n#m), replace (n#m) with the value of (n#m), which isn2– m:m#(n2 – m). Now, use the function definition again. The function definition says “take the value before the # symbol, square it, and subtract the value after the # symbol”: m squared ism2minus the second term, (n2– m), is equal tom2-(n2– m) = m2– n2+ m.

QUESTION 5

The product of A. Option A

$$\left(\frac{a}{b}\right)^2\left(\frac{b}{a}\right)^{-2}\left(\frac{1}{a}\right)^{-1} = ?$$

A. a

B. $\frac{1}{a}$

C. $\frac{a^3}{b^4}$

D. $\frac{a^4}{b^4}$

E. $\frac{a^5}{b^4}$

B. Option B

C. Option C

D. Option D

E. Option E

Correct Answer: E

A fraction with a negative exponent can be rewritten as a fraction with a positive exponent by switching the numerator with the denominator.

$$\left(\frac{a}{b}\right)^2\left(\frac{b}{b}\right)^{-2}\left(\frac{1}{a}\right)^{-1}=\left(\frac{a}{b}\right)^2\left(\frac{a}{b}\right)^2\left(\frac{a}{1}\right)^1=\left(\frac{a^2}{b^2}\right)\left(\frac{a^2}{b^2}\right)(a)=\frac{a^5}{b^4}.$$