SAT2-MATHEMATICS Q&As

SAT Section 2: Mathematics

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QUESTION 1

If the lengths of the edges of a cube are decreased by 20%, the surface area of the cube will decrease by A. 20%.

B. 36%.

C. 40%.

D. 51%.

E. 120%.

Correct Answer: B

The surface area of a cube is equal to 6e2, where e is the length of an edge of a cube. The surface area of a cube with an edge equal to one unit is 6 cubic units. If the lengths of the edges are decreased by 20%, then the surface area

$$6\left(\frac{4}{5}\right)^2=\frac{96}{25}$$

becomes cubic units, a decrease of

$$\frac{6-\frac{96}{25}}{6}=\frac{\frac{54}{25}}{6}=\frac{9}{25}=\frac{36}{100}=36$$

QUESTION 2

Greg has nine paintings. The Hickory Museum has enough space to display three of them. From how many different sets of three paintings does Greg have to choose?

A. 27

B. 56

C. 84

D. 168

E. 504

Correct Answer: C

Be careful not to count the same set of three paintings more than once -- order is not important. A ninechoose-three combination is equal to

$$\frac{\{9\}\{8\}\{7\}}{\{3\}\{2\}\{1\}} = \frac{504}{6} = 84$$

QUESTION 3

$$\frac{\frac{b}{a} - a}{\frac{1}{a^{-1}}} = i$$

A. b

B. $b - a^2$

C. $\frac{b}{a} - 1$

D. $\frac{b}{a^2} - 1$

E. $\frac{b}{a^2} - a$

A. Option A

B. Option B

C. Option C

D. Option D

E. Option E

Correct Answer: D

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

QUESTION 4

SIMULATION

If –6b + 2a – 25 = 5 and a/b + 6 = 4, what is the value of (b/a)2?

A. 1/4

Correct Answer: A

Solve-6b + 2a – 25 = 25 for a in terms of b: -6b + 2a – 25 = 5, -3b + a = 15, a = 15+3b. Substitute a in terms of b into the second equation:

$$\frac{15+3b}{b}+6=4,\ \frac{15}{b}+3+6=4,\ \frac{15}{b}=-5,\ b=-3.$$

Substitute b into the first equation to find the value of a: -6b + 2a – 25 = 5, -6(-3) 2a – 25 = 5, 18+2a = 30, 2a = 12, a = 6. Finally, ,

$$\left(\frac{b}{a}\right)^2=\left(\frac{-3}{6}\right)^2=\left(-\frac{1}{2}\right)^2=\frac{1}{4}.$$

QUESTION 5

SIMULATION

A bus holds 68 people. If there must be one adult for every four children on the bus, how many children can fit on the bus?

A. 52

Correct Answer: A

There is one adult for every four children on the bus. Divide the size of the bus, 68, by

$$5:\frac{68}{5}=13.6$$

There can be no more than 13 groups of one adult, four children. Therefore, there can be no more than (13 groups)(4 children in a group) = 52 children on the bus.