SAT2-MATHEMATICS^{Q&As}

SAT Section 2: Mathematics

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QUESTION 1

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 2

The point (6, –3) could be the midpoint of which of the following lines?

A. a line with endpoints at (0,–1) and (12,–2)

B. a line with endpoints at (2,–3) and (6,1)

C. a line with endpoints at (6,0) and (6,–6)

D. a line with endpoints at (–6,3) and (–6,–3)

E. a line with endpoints at (3,3) and (12,–6)

Correct Answer: C

The midpoint of a line is equal to the average of the x-coordinates and the average of the y-coordinates of

the endpoints of the line. The midpoint of the line with endpoints at and (6, -6) is

$$\left(\frac{6+6}{2}, \frac{0+-6}{2}\right) = \left(\frac{12}{2}, -\frac{6}{2}\right) = (6, -3).$$

QUESTION 3

SIMULATION

The length of a rectangular prism is four times the height of the prism and one-third the width of the prism. If the volume of the prism is 384 in 3, what is the width of the prism?

A. 24

Correct Answer: A

If the height of the prism is h, then the length of the prism is four times that, 4h. The length is one-third of the width, so the width is three times the length: 12h. The volume of the prism is equal to its length multiplied by its width multiplied by its height:

$$(h)(4h)(12h) = 384$$
$$48h^3 = 384$$
$$h^3 = 8$$
$$h = 2$$

The height of the prism is 2 in, the length of the prism is (2 in)(4) = 8 in, and the width of the prism is (8 in)

(3) = 24 in.

QUESTION 4

The equation A. –8 or 8.

$$\frac{x^2}{4} - 3x = -8 \quad When \quad x = ?$$

B. –4 or 4.

C. –4 or –8.

D. 4 or –8.

E. 4 or 8.

Correct Answer: E

Write the equation in quadratic form and find its roots:

$$\frac{x^2}{4} - 3x = -8$$

$$x^2 - 12x = -32$$

$$x^2 - 12x + 32 = 0$$

$$(x - 8)(x - 4) = 0$$

$$x - 8 = 0, \quad x = 4$$

$$\frac{x^2}{4} - 3x = -8 \text{ when } x \text{ is either } 4 \text{ or } 8.$$

QUESTION 5

A box contains five blue pens, three black pens, and two red pens. If every time a pen is selected, it is removed from the box, what is the probability of selecting a black pen followed by a blue pen?

A. $\frac{1}{8}$

B. $\frac{1}{10}$

C. $\frac{1}{50}$

D. $\frac{3}{20}$

E. $\frac{77}{90}$

A. Option A

B. Option B

C. Option C

D. Option D

E. Option E

Correct Answer: A

At the start, there are 5 + 3 + 2 = 10 pens in the box, 3 of which are black. Therefore, the probability of selecting a black pen is 3/10 After the black pen is removed, there are nine pens remaining in the box, five of which are blue. The

$$\left(\frac{3}{10}\right)\left(\frac{5}{9}\right)=\frac{15}{90}=\frac{1}{6}$$

probability of selecting a blue pen second is 5/9 To find the probability that both events will happen, multiply the probability of the first event by the probability of the second event:

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