PCAT-SECTION3 Q&As

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QUESTION 1

Evaluate the following definite integral:

$$\int_2^4 \left(x^4 - 6x\right) dx$$

A. 123.6

B. 162.4

C. 183.7

D. 250.2

Correct Answer: B

You begin by solving the integral and then evaluating the result between the limits of 2 and 4.

$$\int_2^4 \left(x^4 - 6x\right) dx = \left(\frac{x^5}{5} - \frac{6x^2}{2}\right) = \left(\frac{x^5}{5} - 3x^2\right)\Big|_2^4 = \left(\frac{(4)^5}{5} - 3(4)^2\right) - \left(\frac{(2)^5}{5} - 3(2)^2\right)$$

$$= \left(\frac{1024}{5} - 48\right) - \left(\frac{32}{5} - 12\right) = \frac{812}{5} = 162.4$$

QUESTION 2

Evaluate the following indefinite integral:

$$\int 10t^4 dt$$

A. $2t^5 + C$ B. $10t^5 + C$ C. $\frac{2}{5}t^5 + C$ D. $\frac{10}{3}t^5 + C$

A. Option A

B. Option B

C. Option C

D. Option D

Correct Answer: A

Evaluatingthese integral yields:

$$\int 10t^4 dt = \frac{10}{5}t^5 = 2t^5 + C.$$

QUESTION 3

If ,

$$\sqrt[3]{x} = y^4$$

then what is x in terms of y?

A. x=y12

B. x=y7

C. x = y4

D. x=y

Correct Answer: A

QUESTION 4

Solve for x: x2 12 x=36

A. 2

B. 3

C. 4

D. 6

Correct Answer: D

The first thing to do in solving the equationx2 12x=36 forxis to rewrite the equation by adding 36 to both sides and then to express the equation in terms of factors: x2 12x+ 36 = 0 (x6) · (x 6) = 0 Solving the equation forxyieldsx= 6.

QUESTION 5

Evaluate the following definite integral:

$$\int_{1}^{9} 3t^3 dt$$

A. 4920

B. 2560

C. 2179

D. 1659

Correct Answer: A

QUESTION 6

Evaluate the following derivative: d/dx(5x4)

A. 0

B. 5x4

C. 20x3

D. 5x3

Correct Answer: C

QUESTION 7

Chemistry students performed nine volume measurements of a solution during a lab and obtained the

following results:

{2.4mL, 3.2mL, 3.7mL, 3.7mL, 4.5mL, 6.8mL, 7.3mL, 8.1mL, 12.2mL}

What is the mean of the data set?

A. 3.7mL

B. 4.5mL

C. 5.8mL

D. 9.8mL

Correct Answer: C

The mean of a data set is the arithmetic average of the values of the data set or

$$\frac{2.4mL+3.2mL+3.7mL+3.7mL+4.5mL+6.8mL+7.3mL+8.1mL+12.2mL}{9}$$

$$=\frac{51.9mL}{9}=5.8mL.$$

QUESTION 8

Solve for x: 4(2x + 20) +3(x 1) = 0

A. 11

B. 7

C. -7

D. 11

Correct Answer: C

This equation can be solved by simplifying each side of the equation, combining like terms, isolatingxon one side of the equation and then solving forx:

$$\begin{aligned}4(2x+20)+3(x-1)&=0\\8x+80+3x-3&=0\\11x+77&=0\\x&=-\frac{77}{11}=-7.\end{aligned}$$

QUESTION 9

$(6x^2y^5z^3)\div(3x^2y^3z^6)=$

A. $\frac{z^2}{2y^3}$ B. $\frac{y^2}{2z^3}$ C. $\frac{2y^2}{z^3}$ D. $\frac{2z^2}{y^3}$

A. Option A

B. Option B

C. Option C

D. Option D

Correct Answer: C

$x: \frac{x^2+x-42}{x+7}=1$

QUESTION 10

Evaluate the following derivative:

$\frac{d}{dx}\left(25-7x^3\right)$ at $x=-2$

A. 35

B. 84

C. -84

D. 120

Correct Answer: C

You first must calculate the derivative before you can evaluate the derivative at a given point.

$\frac{d}{dx}\left(25-7x^3\right)=-21x^2.$

The derivative can now be evaluated at x=2 by plugging in the value of 2 for x in the derivative or

$\left.\frac{d}{dx}\left(25-7x^3\right)\right|_{x=-2}=-21\cdot(-2)^2=-21\cdot 4=-84.$

QUESTION 11

What are the roots of the quadratic equation 3x2 x 10 = 0?

A. $x=\sqrt{2},\ -\frac{5}{3}$ B. $x=2,\ -\sqrt{\frac{5}{3}}$ C. $x=-2,\ \sqrt{\frac{5}{3}}$ D. $x=2,\ -\frac{5}{3}$

A. Option A

B. Option B

C. Option C

D. Option D

Correct Answer: D

QUESTION 12

What is the probability of selecting an ace of a red suit from a standard deck of cards?

A. 1/52

B. 2/52

C. 48/52

D. 50/52

Correct Answer: B

To determine the probability that a randomly selected card is an ace of a red suit, you should first note that a card can be selected from a deck inn= 52 different ways. Since there are two such aces (ace of hearts and ace of diamonds), then an ace can be drawn from the deck ins= 2 different ways. Thus, the probability that the selected card is an ace is:

$$p = \frac{s}{n} = \frac{2}{52}.$$

QUESTION 13

Express 239 in scientific notation.

A. 2.39×10^0 B. 2.39×10^1 C. 2.39×10^2 D. 2.39×10^3

A. Option A

B. Option B

C. Option C

D. Option D

Correct Answer: C

The number 239 is expressed in scientific notation by first expressing the value in terms of a real number such that 1 a

2.39 × 100 = 2.39 × 102.

QUESTION 14

Solve for x: x3 64x = 0

A. x=± 8

B. x=± 6

C. x=± 4

D. x=± 2

Correct Answer: A

In order to solve the equationx3 64x= 0 forx, you can apply factor analysis and solve for x in each term:

$$\frac{x^3}{x}-\frac{64x}{x}=\frac{0}{x}$$
$$x^2-64=0$$
$$x=\pm 8.$$

QUESTION 15

What is the probability that two cards drawn from a deck of cards are face cards (king, queen, or jack) of any suit if the first card drawn is replaced before the second card is drawn?

A. 9/169

B. 1/16

C. 3/13

D. 1/26

Correct Answer: A