

Assignment for Teachers- Chapter 11(14.4.2026)

Section A

- $\int_1^4 e^{x+1.3} dx =$
A. $e^4 - e^1$ B. $e^{5.3} - e^1$ C. $e^{5.3} - e^{2.3}$ D. $e^4 - e^{2.3}$.
- $\int_1^3 \sqrt{4x-3} \, dx =$
A. $\frac{13}{3}$ B. $\frac{25}{3}$ C. $\frac{11}{3}$ D. $\frac{41}{3}$.
- $\int_0^{2\pi} \sin\left(\frac{x}{2}\right) dx =$
A. 5 B. 6 C. 3 D. 4.
- The value of $\int_0^{\frac{\pi}{3}} 16 \cos^4 \theta \sin \theta \, d\theta$ is
A. -0.1 B. 3.1 C. 0.1 D. -3.1.
- The value of $\int_0^1 (3 \sin 2\theta - 4 \cos \theta) \, d\theta$, correct to 4 significant figures, is
A. -0.06890 B. -1.242 C. -2.742 D. -1.569.
- The traffic flow rate (cars per hour) across an intersection is
 $r(t) = 200 + 800t - 90t^2$, where t is in hours and $t = 0$ is 6 am.
The number of cars pass through the intersection from 6 am to 10 am is
A. 5428 B. 5824 C. 5082 D. 5280.
- An object is moving with a velocity (ft/sec) $v = t^2 - 3t - 10$.
The displacement travelled from $t = 0$ to $t = 6$ is
A. 18 ft B. 72 ft C. -42 ft D. -52 ft.

8. Area of the region bounded by the curve $y = \cos x$ between $x = 0$ and

$x = \frac{\pi}{2}$ is

- A. 1 unit² B. 3 unit² C. 5 unit² D. 7 unit²

9. The area, in square units, enclosed by the curve $y = 2x + 3$, the x -axis and ordinates $x = 1$ and $x = 4$ is

- A. 28 unit² B. 32 unit² C. 24 unit² D. 39 unit².

10. Volume formed by rotating $y = x$, $x \in [0,1]$, about x -axis is

- A. $\frac{\pi}{3}$ unit³ B. $\frac{\pi}{2}$ unit³ C. π unit³ D. $\frac{2\pi}{3}$ unit³.

Section B

1. Evaluate $\int_{-\sqrt{3}}^{\sqrt{3}} \frac{6 - 2x^2}{(3 + x^2)^2} dx$.

Solution

Now check:

$$\frac{d}{dx} \frac{x}{3 + x^2} =$$

- A. $\frac{6 - 2x^2}{(3 + x^2)^2}$ B. $\frac{-6 + 2x^2}{(3 + x^2)^2}$ C. $\frac{3 - x^2}{(3 + x^2)^2}$ D. $\frac{-3 + x^2}{(3 + x^2)^2}$.

$$\text{Thus } \frac{6 - 2x^2}{(3 + x^2)^2} =$$

- A. $2 \times \frac{d}{dx} \frac{x}{3 + x^2}$ B. $(-1) \times \frac{d}{dx} \frac{x}{3 + x^2}$ C. $1 \times \frac{d}{dx} \frac{x}{3 + x^2}$ D. $(-2) \times \frac{d}{dx} \frac{x}{3 + x^2}$.

$$\int_{-\sqrt{3}}^{\sqrt{3}} \frac{6 - 2x^2}{(3 + x^2)^2} dx =$$

A. $\frac{2\sqrt{3}}{4}$ B. $\frac{\sqrt{3}}{3}$ C. $\frac{\sqrt{3}}{4}$ D. $\frac{2\sqrt{3}}{3}$.

2. Identify the curves whose gradient function is $\frac{dy}{dx} = 2x$ and find the equation of the curve with the gradient function in a which has a y-intercept (0, 4).

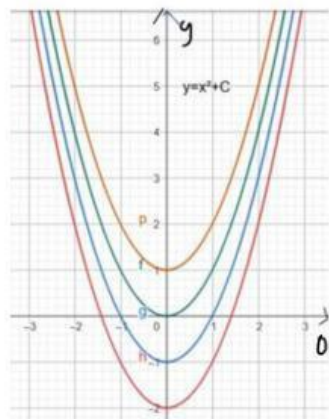
Solution

$$\frac{dy}{dx} = 2x$$

Integrating, $y =$

A. $2x^2 + C$ B. $x^2 + C$ C. $\frac{x^2}{2} + C$ D. $3x^2 + C$.

This represents a family of parallel curves.



The curve passes through (0, 4), $C =$

A. 1 B. 3 C. 2 D. 4.

Thus $y =$

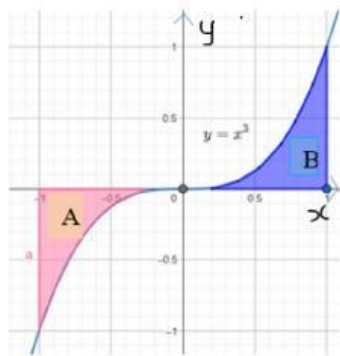
A. $x^2 + 4$ B. $2x^2 + 1$ C. $\frac{x^2}{2} + 3$ D. $3x^2 + 2$.

3. Find the area between the curve $y = x^3$ and the x-axis between the values $x = -1$ and $x = 1$.

Solution

The curve intersects the x- axis at x =

A. - 1 B. 1 C. 0 D.0.5.



The area of A and the area of B are

- A. $\int_{-1}^0 x^3 dx$ and $\int_0^1 x^3 dx$
- B. $\int_{-1}^0 (-x^3) dx$ and $\int_0^1 (-x^3) dx$
- C. $\int_{-1}^0 x^3 dx$ and $\int_0^1 (-x^3) dx$
- D. $\int_{-1}^0 (-x^3) dx$ and $\int_0^1 x^3 dx$.

The required area =

- A. $\frac{1}{4}$ unit² B. $\frac{1}{2}$ unit² C. $\frac{1}{5}$ unit² D. $\frac{1}{3}$ unit².

Section C

1. The equation of a curve has second derivative, $\frac{d^2y}{dx^2} = -12x + 4$.

It passes through the point (3, 34), where it has gradient -12 .

Find the equation of the curve.

Solution

$$\frac{d^2y}{dx^2} = -12x + 4.$$

Integrate to get first derivative,

$$\frac{dy}{dx} = \int(-12x + 4)dx$$

- A. $6x^2 - 4x + C_1$ B. $-6x^2 + 4x + C_1$
C. $-6x^2 - 4x + C_1$ D. $6x^2 + 4x + C_1$.

Use gradient condition at $x = 3$, $C_1 =$

- A. 30 B. 40 C. 50 D. 60.

Thus, we have $\frac{dy}{dx}$.

Integrate again to get y ,

$$y =$$

- A. $2x^3 + 2x^2 + 30x + C_2$ B. $-2x^3 + 2x^2 - 30x + C_2$
C. $-2x^3 + 2x^2 + 30x + C_2$ D. $-2x^3 - 2x^2 + 30x + C_2$.

Use point (3, 34) in y , $C_2 =$

- A. -20 B. 20 C. 23 D. -23 .

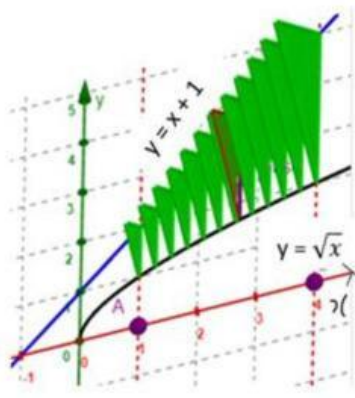
The equation of curve, $y =$

- A. $-2x^3 + 2x^2 - 30x + 20$ B. $-2x^3 + 2x^2 + 30x + 23$

C. $-2x^3 + 2x^2 + 30x - 20$ D. $-2x^3 + 2x^2 + 30x - 23$.

2. For $1 \leq x \leq 4$, determine the volume of the solid where each face is a triangle with a base of $(x+1)$ ft and a height of $\sqrt{x}$.

Solution



The area of the triangle =

A. $\frac{1}{3}(x^{\frac{3}{2}} + x^{\frac{1}{2}})$ B. $\frac{1}{2}(x^{\frac{3}{2}} - x^{\frac{1}{2}})$ C. $\frac{1}{2}(x^{\frac{3}{2}} + x^{\frac{1}{2}})$ D. $\frac{1}{3}(x^{\frac{3}{2}} - x^{\frac{1}{2}})$.

$\int_1^4 x^{\frac{3}{2}} dx =$

A. $\frac{-62}{5}$ B. $\frac{26}{5}$ C. $\frac{-26}{5}$ D. $\frac{62}{5}$.

$\int_1^4 x^{\frac{1}{2}} dx =$

A. $\frac{-14}{3}$ B. $\frac{14}{3}$ C. $\frac{-41}{3}$ D. $\frac{41}{3}$.

The volume of the solid =

A. $\frac{1}{3} \int_1^4 (x^{\frac{3}{2}} + x^{\frac{1}{2}}) dx$ B. $\frac{1}{2} \int_1^4 (x^{\frac{3}{2}} + x^{\frac{1}{2}}) dx$

C. $\frac{1}{2} \int_1^4 (x^{\frac{3}{2}} - x^{\frac{1}{2}}) dx$ D. $\frac{1}{3} \int_1^4 (x^{\frac{3}{2}} - x^{\frac{1}{2}}) dx$.

The required Volume is

A. $\frac{218}{15} \text{ ft}^3$ B. $\frac{821}{15} \text{ ft}^3$ C. $\frac{182}{15} \text{ ft}^3$ D. $\frac{128}{15} \text{ ft}^3$.
