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INU peshawar

Q1

a.  $\int x^2 e^x dx.$

Sol:-  $\int x^2 e^x dx = e^x (x^2 - 2x + 2) + C.$

~~by~~ integration by parts.

Let

$$u = x^2 \text{ and } v = e^x$$

then  $du = 2x dx$  &  $e$

$$dv = e^x dx.$$

Now integration by parts states that.

$$\int u(x)v'(x) dx = u(x)v(x) - \int v(x)u'(x) dx.$$

Hence.

$$\int x^2 e^x dx = x^2 e^x - \int e^x 2x dx.$$

$$= x^2 e^x - 2 \int x e^x dx + C \rightarrow \textcircled{1}$$

2

Now Set  $u = x$  then  
 $du = dx$ .

and

$$\int x e^x dx = x e^x - \int e^x \cdot x dx$$

or

$$\int x e^x dx = x e^x - \int e^x dx$$
$$= x e^x - e^x.$$

putting this in (1)  
we get.

$$\int x^2 e^x dx = x^2 e^x - 2(x e^x - e^x) + C.$$

$$= e^x (x^2 - 2x + 2) + C.$$

$$b. \int (5x^2 + x^{-2} + 215) dx.$$

$$\int 5x^2 dx + \int x^{-2} dx + \int 15 dx$$

$$= \frac{5x^3}{3} + \frac{x^{-1}}{-1} + 15x + C.$$

$$\frac{5}{3} x^3 - x^{-1} + 15x + C.$$

$$c. \int (x^3 + x^{-2} + 5) dx.$$

$$\int x^3 dx + \int x^{-2} dx + \int 5 dx.$$

$$= \frac{x^4}{4} + \frac{x^{-1}}{-1} + 5x + C$$

$$= \frac{x^4}{4} - x^{-1} + 5x + C$$

Q2

a → Solution

56% of the homes  
in colony have a  
car  
it means that  
if 56% of the  
home have a  
car then

$$44\% = 100\% - 56\%$$

have not a  
car in colony.  
 $x = 44\%$

b.

Total Students  
= 1029.

No of girls = 504.

No of boys =  $x = ?$

$$x + 504 = 1029$$

$$x = 1029 - 504$$

$$x = 525$$

Boys ratio

$$= \frac{525}{504}$$

$$= 1.04$$

Boys

$$\frac{525}{504} = 1.$$

Girls

$$\frac{504}{525} = 0.96$$

①

Amna.

$$\text{Scored} = \frac{46}{50} \times 100$$

In maths

$$= 92.1.$$

In chemistry

$$\frac{64}{75} \times 100$$

$$= 85.3\%$$

$$\text{phy scis} = \frac{72}{80} \times 100$$

$$= 90.1.$$

Best score in

maths which  
is 92.1.

Q3

Q

$$S = e$$

$$-4t^{-5} + 4/t + 5t + 1/4$$

$$S = -4t^{-5} + 4/t + 5t + 1/4.$$

$$S = -4t^{-5} + 4t^{-1} + 5t + 1/4.$$

Taking derivative

$$-4 \frac{d}{dt} (t^{-5}) + 4 \frac{d}{dt} (t^{-1}) +$$

$$5 \frac{d}{dt} (t) + \frac{1}{4} \frac{d}{dt} (t^0)$$

$$\rightarrow -4(-5t^{-6}) + 4(-1t^{-2}) +$$

$$5(t^0) + 0.$$

$$\rightarrow 20t^{-6} - 4t^{-2} + 5.$$



Q3

b.

$$y = x^5 + 3x^3 - x^2 + 4$$

Sol.

$$\frac{d}{dx}(x^5) + 3 \frac{d}{dx}(x^3) -$$

$$\frac{d}{dx}(x^2) + \frac{d}{dx}(4).$$

$$\Rightarrow 5x^4 + 3(3x^2) - 2x + 0$$

$$5x^4 + 9x^2 - 2x.$$

Q3

C.  $T = 6x^{-3} + x^3 + 5x - 2.$

$$\frac{d}{dx} (6x^{-3}) + \frac{d}{dx} x^3$$

$$+ \frac{d}{dx} (5x) - \frac{d}{dx} (2).$$

$$6(-3x^{-4}) + 3x^2 + 5 = 0.$$

$$-18x^{-4} + 3x^2 + 5.$$