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is called a repuable equation if the function
$$f(x, y)$$
 and into the product of two functions of x and y $f(x, y) = p(x)h(y)$

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where
$$p(x)$$
 and $h(y)$
are continuous
$$functions$$

$$y'=f(x,y)$$

$$y'=p(x)h(y)$$

$$dx$$

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$$\Rightarrow \frac{dy}{h(y)} = p(x) dx$$

$$h(y)$$

$$h(y) = \frac{1}{h(y)},$$

$$h(y) \neq 0$$

$$\Rightarrow g(y) dy = p(x) dx$$

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$$= \int G(y) dy = \int P(x) dx$$

$$= \int G(y) = P(x) + C$$

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(Ex) Solve the
diffurtial equation

$$(x^2 + 4) y' = 2xy$$

 $(x^2 + 4) dy = 2xy$
 dx
 $\Rightarrow (x^2 + 4) dy = 2xy dx$

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$$\Rightarrow \frac{dy}{y} = \frac{2x}{x^2 + 4} dx$$

$$\int \frac{dy}{y} = \int \frac{2x}{x^2 + 4} dx$$

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$$\int \frac{dy}{y} = \int \frac{dx}{x^2 + 4} dx$$

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$$= |n|y| = |n|u| + C$$

$$= |n|y| = |n|x^2 + 4 + C$$

$$= |mp|i \text{ int solution}$$

$$= |my| = |m|x^2 + 4 + C$$

$$= |y| = |m|x^2 + 4 + C$$

$$= |y| = |m|x^2 + 4 + C$$

$$|y| = C|x^2 + 4|$$
(Ex) Solve the
diff. equation
$$(x^2 - 1) y dx + x^2 dy = 0$$

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$$\Rightarrow \int y^{-3} dy = -\left(1 - x^{-2}\right) dx$$

$$\Rightarrow -\frac{1}{2y^2} = -x - \frac{1}{x} + C$$

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Solve
$$(1+e^{x}) dy = e^{x} dx$$

$$(1+e^{x})$$

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(Ex) Some the initial value problem
$$y' = \frac{x(e^x + 2)}{6y^2}$$
,

$$\frac{dy}{dx} = \frac{x(e^{x^2} + 2)}{6y^2}$$

$$= \frac{3}{6}y^2 dy = \frac{x(e^{x^2} + 2)dx}{x(e^{x^2} + 2)dx}$$

$$= \frac{3}{6}y^2 dy = \frac{x(e^{x^2} + 2)dx}{x(e^{x^2} + 2)dx}$$

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$$\frac{3}{3} = \frac{1}{2} e^{4} dx + 2x^{2} + C$$

$$= 2x^{2} + C$$

$$= 2y^{3} = 1 e^{x^{2}} + x^{2} + C$$

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$$y(0) = 1$$

$$x = 0, y = 1$$

$$\Rightarrow 2(1)^{3} = 1e^{0} + 0 + C$$

$$\Rightarrow 2 = 1(1) + C$$

$$\Rightarrow C = \frac{3}{2}$$

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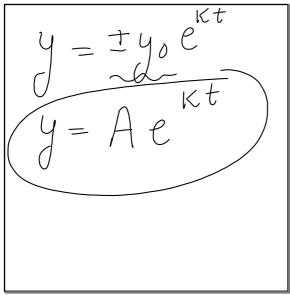
$$\int_{2}^{3} \int_{2}^{3} dx = \int_{2}^{3} e^{x^{2}} + x^{2} + \frac{3}{2}$$

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

$$\int_{2}^{3} \int_{2}^{3} \int_{2}^{3} dx = \int_{2}^{3} \int_{2}^{3} \int_{2}^{3} dx = \int_{2}^{3} \int_{2}^{3} \int_{2}^{3} \int_{2}^{3} dx = \int_{2}^{3} \int_{2}^{3}$$

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