

```
> restart
```

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>
```

$$\left(3x^2y - 6xy^2 + 8y^3\right) + \left(x^3 - 6x^2y + 24xy^2\right) \frac{dy}{dx} = 0$$

```
> Ecuacion := 3·x·2·y(x) - 6·x·y(x)·2 + 8·y(x)·3 + (x·3 - 6·x·2·y(x) + 24·x·y(x)·2)·diff(y(x), x) = 0;
```

$$Ecuacion := 3x^2y(x) - 6xy(x)^2 + 8y(x)^3 + (x^3 - 6x^2y(x) + 24xy(x)^2) \left(\frac{d}{dx} y(x)\right) = 0 \quad (1)$$

```
> with(DEtools):
```

```
> odeadvisor(Ecuacion);
```

```
[_homogeneous, class A], _exact, _rational, _dAlembert] (2)
```

```
> M(x, y) := 3x^2y - 6xy^2 + 8y^3;
```

$$M(x, y) := 3x^2y - 6xy^2 + 8y^3 \quad (3)$$

```
> N(x, y) := x^3 - 6x^2y + 24xy^2;
```

$$N(x, y) := x^3 - 6x^2y + 24xy^2 \quad (4)$$

```
> comprobacion1 := diff(M(x, y), y) - diff(N(x, y), x) = 0;
```

$$comprobacion1 := 0 = 0 \quad (5)$$

```
> IMx := int(M(x, y), x);
```

$$IMx := x^3y - 3x^2y^2 + 8y^3x \quad (6)$$

```
> INy := int(N(x, y), y);
```

$$INy := x^3y - 3x^2y^2 + 8y^3x \quad (7)$$

```
> SolGral1 := simplify(IMx + int((N(x, y) - diff(IMx, y)), y)) = C1;
```

$$SolGral1 := x^3y - 3x^2y^2 + 8y^3x = C1 \quad (8)$$

```
> SolGral2 := simplify(INy + int((M(x, y) - diff(INy, x)), x)) = C1;
```

$$SolGral2 := x^3y - 3x^2y^2 + 8y^3x = C1 \quad (9)$$

```
> restart:
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$$(6y^2 + 12xy^4 - 32x^2y) + (6xy + 16x^2y^3 - 8x^3) \frac{dy}{dx} = 0$$

```
> EcuacionNoExacta := 6·y(x)·2 + 12·x·y(x)·4 - 32·x·2·y(x) + (6·x·y(x) + 16·x·2·y(x)·3 - 8·x·3)·diff(y(x), x) = 0;
```

$$EcuacionNoExacta := 6y(x)^2 + 12xy(x)^4 - 32x^2y(x) + (6xy(x) + 16x^2y(x)^3 - 8x^3) \left(\frac{d}{dx} y(x)\right) = 0 \quad (10)$$

```
> with(DEtools):
```

```
> odeadvisor(EcuacionNoExacta);
```

```
[_rational] (11)
```

```
> FactorIntegrante := intfactor(EcuacionNoExacta);
FactorIntegrante := x (12)
```

```
> M(x,y) := 6 y^2 + 12 x y^4 - 32 x^2 y;
M(x,y) := 6 y^2 + 12 x y^4 - 32 x^2 y (13)
```

```
> N(x,y) := 6 x y + 16 x^2 y^3 - 8 x^3;
N(x,y) := 6 x y + 16 x^2 y^3 - 8 x^3 (14)
```

```
> MM(x,y) := expand(FactorIntegrante·M(x,y));
MM(x,y) := 6 x y^2 + 12 x^2 y^4 - 32 x^3 y (15)
```

```
> NN(x,y) := expand(FactorIntegrante·N(x,y));
NN(x,y) := 6 x^2 y + 16 x^3 y^3 - 8 x^4 (16)
```

```
> comprobacion := simplify(diff(MM(x,y),y) - diff(NN(x,y),x)) = 0
comprobacion := 0 = 0 (17)
```

```
> IMMx := int(MM(x,y),x);
IMMx := 3 x^2 y^2 + 4 x^3 y^4 - 8 x^4 y (18)
```

```
> SolGral := IMMx + int((NN(x,y) - diff(IMMx,y)),y) = C1;
SolGral := 3 x^2 y^2 + 4 x^3 y^4 - 8 x^4 y = C1 (19)
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