

1.  $2xyy' = 2y^2 + x^2 \sin(y/x)$  is

- (a) a linear equation.
- (b) a homogeneous equation.
- (c) a separable equation.
- (d) a Bernoulli equation.
- (e) none of the above.

2.  $2xy^2y' = 2x^2y - 5x^3$  is

- (a) a linear equation.
- (b) a separable equation.
- (c) a Bernoulli equation.
- (d) a homogeneous equation.
- (e) none of the above.

3.  $xy' = 3x^3y^2 - 2x^3y^3$  is

- (a) a Bernoulli equation.
- (b) a linear equation.
- (c) a separable equation.
- (d) a homogeneous equation.
- (e) none of the above.

4.  $y' = x^2 [\sin(2y) - 2xy]$  is

- (a) a separable equation.
- (b) a linear equation.
- (c) a Bernoulli equation.
- (d) a homogeneous equation.
- (e) none of the above.

5.  $3y' + 2x^2y^4 - 3x^{-1}y = 0$  is

- (a) a linear equation.
- (b) a separable equation.
- (c) a Bernoulli equation.
- (d) a homogeneous equation.
- (e) none of the above.

6.  $x^2y' = 2xy - 5xe^x$  is

- (a) a linear equation.
- (b) a separable equation.
- (c) a Bernoulli equation.
- (d) a homogeneous equation.
- (e) none of the above.

7. The general solution of  $y' = 6xy^{1/3} - \frac{3y}{x}$  is:

- (a)  $y = \left(\frac{x^2 + C}{x}\right)^2$
- (b)  $y^2 = \left(\frac{x^4 + C}{x^2}\right)^3$
- (c)  $y = \left(x + \frac{C}{x}\right)^{3/2}$
- (d)  $y^{2/3} = C(1 + x^2)$
- (e) None of the above.

8. The general solution of  $xy' = 6x^2e^{2x} + y$  is:

- (a)  $y = 3e^{2x} + C$
- (b)  $y = 6xe^{2x} + Cx$
- (c)  $y = 3xe^{-2x} + Cx^2$
- (d)  $y = 3xe^{2x} + Cx$
- (e) None of the above.

9. The general solution of  $xy^2\frac{dy}{dx} = x^3 + y^3$  is:

- (a)  $y^2 = x^2 \ln Cx^2$
- (b)  $y^3 = x \ln Cx^3$
- (c)  $y^2 = x^2 \ln x^3 + Cx^2$
- (d)  $y^3 = x^3 \ln Cx^3$
- (e) None of the above.

10. The general solution of  $xe^{y/x}\frac{dy}{dx} = x + ye^{y/x}$  is:

- (a)  $y = x \ln(Cx)$
- (b)  $y = x \ln(\ln x + C)$
- (c)  $y = x \ln(\ln x) + Cx$
- (d)  $y = x \ln x + Cx$
- (e) None of the above.

11. The general solution of  $2y \frac{dy}{dx} = 2xy^2 + 2x - y^2 - 1$  is:

- (a)  $y^2 = Ce^{x^2-x} - 1$
- (b)  $y^2 = e^{x^2-x} + C$
- (c)  $y^2 = Ce^{x-1} + 1$
- (d)  $y^2 + 1 = e^{x^2-x} + C$
- (e) None of the above.

12. The general solution of  $x^2y' + 2xy - y^3 = 0$  is:

- (a)  $y^2 = \frac{4x}{Cx^2 + 1}$
- (b)  $y^2 = \frac{2 + Cx^5}{3x}$
- (c)  $y^2 = \frac{5x}{2 + Cx^5}$
- (d)  $y^2 = \frac{2 + Cx^4}{5x}$
- (e) None of the above.

13. The general solution of  $y' = \frac{x^3 + x^2y + 3y^3}{x^3 + 3xy^2}$  is:

- (a)  $y^3 + x^2y = \ln x^3 + Cx^3$
- (b)  $y^3 + x^2y = x^3 \ln x + Cx^3$
- (c)  $y^3 + x^2y = \ln x + C$
- (d)  $y^3 + x^3 = x^3 \ln x + C$
- (e) None of the above.

14. The general solution of  $x^2y' + 2y = 2e^{1/x}\sqrt{y}$  is:

- (a)  $y^{1/2} = \frac{1}{x} e^{1/x} + Cx$
- (b)  $y^{1/2} = e^{1/x} \left( \frac{C-x}{x} \right)$
- (c)  $y^{1/2} = xe^{1/x}(Cx + 1)$
- (d)  $y^{1/2} = e^{1/x} \left( \frac{Cx-1}{x} \right)$
- (e) None of the above.

15. The general solution of  $y' = \frac{y + \sqrt{x^2 - y^2}}{x}$  is:

(a)  $y = x \sin(\ln x + C)$

(b)  $y = x \ln(\sin x + C)$

(c)  $y = x \sin(\ln x) + Cx$

(d)  $y = \sin(\ln x) + C$