

EMCF Quiz 3 Due Wednesday, January 29 at 11:59 PM

1. $2xy^2y' = 2x^2y - 5x^3$ is

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

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

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

3. $y' = x^2(\cos 2y - 2xy)$ is

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

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

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

5. $2xyy' = 2y^2 + x^2 \sin(y/x)$ is

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

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

(a) $y^2 = \left(\frac{x^4 + C}{x^2}\right)^3$

(b) $y = \left(\frac{x^2 + C}{x}\right)^2$

(c) $y = \left(x + \frac{C}{x}\right)^{3/2}$

(d) $y^{2/3} = C(1 + x^2)$

(e) None of the above.

7. The general solution of $xy' = 4x^2e^{2x} + y$ is

(a) $y = 2xe^{2x} + Cx$

(b) $y = 2e^{2x} + C$

(c) $y = 4xe^{2x} + Cx$

(d) $y = 2xe^{-2x} + Cx^2$

(e) None of the above.

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

9. 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.

10. The solution of the initial-value problem $2y \frac{dy}{dx} = 2xy^2 + 2x - y^2 - 1$, $y(0) = 1$ is:

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

11. 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.

12. 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.

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

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

14. The solution of the initial-value problem $xy' + y = x^4y^4$, $y(1) = 1/2$ is:

(a) $y^{-3} = x^3(5 - 4x)$

(b) $y = \frac{1}{x(11 - 3x)^3}$

(c) $y^3 = \frac{1}{x(11 - 3x)}$

(d) $y = \frac{1}{x(11 - 3x)^{1/3}}$

(e) None of the above.