MATH 1551 Differential Calculus: Differential Equations

1. What is a differential equation?

A. An equation that relates two functions of one variable

B. An equation that relates two functions of two variables

C. An equation that relates a function and its derivative

D. An equation that relates a function and its integral

2. What is the order of a differential equation?

A. The highest derivative that appears in the equation

B. The highest power of the independent variable that appears in the equation

C. The highest power of the dependent variable that appears in the equation

D. The number of derivatives that appear in the equation

3. What is the degree of a differential equation?

A. The highest derivative that appears in the equation

B. The highest power of the independent variable that appears in the equation

C. The highest power of the dependent variable that appears in the equation

D. The number of derivatives that appear in the equation

4. What is the general solution of a differential equation?

A. A particular solution of the equation

B. The set of all solutions of the equation

C. The set of all solutions of the equation that satisfy a given initial condition

D. The set of all solutions of the equation that satisfy a given boundary condition

5. What is a particular solution of a differential equation?

A. A solution of the equation that satisfies a given initial condition

B. A solution of the equation that satisfies a given boundary condition

C. A solution of the equation that is valid for all values of the independent variable

D. A solution of the equation that is valid for some specific values of the independent variable

6. What is an initial value problem?

A. A differential equation with a given initial condition

B. A differential equation with a given boundary condition

C. A differential equation with no given conditions

D. A differential equation with both an initial and boundary condition

7. What is a boundary value problem?

A. A differential equation with a given initial condition

B. A differential equation with a given boundary condition

C. A differential equation with no given conditions

D. A differential equation with both an initial and boundary condition

8. What is the order of a first-order differential equation?

A. One

B. Two

C. Three

D. There is no such thing as an order for a differential equation

9. What is the order of a second-order differential equation?

A. One

B. Two

C. Three

D. There is no such thing as an order for a differential equation

10. What is the order of a third-order differential equation?

A. One

B. Two

C. Three

D. There is no such thing as an order for a differential equation

11. What is the degree of a first-order differential equation?

A. One

B. Two

C. Three

D. There is no such thing as a degree for a differential equation

12. What is the degree of a second-order differential equation?

A. One

B. Two

C. Three

D. There is no such thing as a degree for a differential equation

13. What is the degree of a third-order differential equation?

A. One

B. Two

C. Three

D. There is no such thing as a degree for a differential equation

14. What is the general solution of the differential equation dy/dx = x^2?

A. y = x^3 + C

B. y = x^2 + C

C. y = x + C

D. There is no such thing as a general solution for a differential equation

15. What is the particular solution of the differential equation dy/dx = x^2 with the initial condition y(0) = 1?

A. y = x^3 + 1

B. y = x^2 + 1

C. y = x + 1

D. There is no such thing as a particular solution for a differential equation

16. What is the general solution of the differential equation d^2y/dx^2 = x^2?

A. y = x^3/3 + C_1x + C_2

B. y = x^2/2 + C_1x + C_2

C. y = x + C_1x + C_2

D. There is no such thing as a general solution for a differential equation

17. What is the particular solution of the differential equation d^2y/dx^2 = x^2 with the initial conditions y(0) = 0 and y'(0) = 1?

A. y = x^3/3 + x

B. y = x^2/2 + x

C. y = x + 1

D. There is no such thing as a particular solution for a differential equation

18. What is the general solution of the differential equation d^3y/dx^3 = x^2?

A. y = x^5/5 + C_1x^2 + C_2x + C_3

B. y = x^4/4 + C_1x^2 + C_2x + C_3

C. y = x^3/3 + C_1x^2 + C_2x + C_3

D. There is no such thing as a general solution for a differential equation

19. What is the particular solution of the differential equation d^3y/dx^3 = x^2 with the initial conditions y(0) = 0, y'(0) = 0, and y''(0) = 1?

A. y = x^5/5 + x^2/2 + x

B. y = x^4/4 + x^2/2 + x

C. y = x^3/3 + x^2/2 + x

D. There is no such thing as a particular solution for a differential equation

20. What is an ordinary differential equation?

A. A differential equation that contains only one derivative

B. A differential equation that contains only derivatives of the first kind

C. A differential equation that contains only derivatives of the second kind

D. There is no such thing as an ordinary differential equation

21. What is a partial differential equation?

A. A differential equation that contains only one derivative

B. A differential equation that contains only derivatives of the first kind

C. A differential equation that contains only derivatives of the second kind

D. There is no such thing as a partial differential equation

22. What is a linear differential equation?

A. A differential equation that can be written in the form ax + by = c

B. A differential equation that can be written in the form ax^2 + by^2 = c

C. A differential equation that can be written in the form ax^2 + by^2 + cz^2 = d

D. There is no such thing as a linear differential equation

23. What is a nonlinear differential equation?

A. A differential equation that can be written in the form ax + by = c

B. A differential equation that can be written in the form ax^2 + by^2 = c

C. A differential equation that can be written in the form ax^2 + by^2 + cz^2 = d

D. There is no such thing as a nonlinear differential equation

24. What is an exact differential equation?

A. A differential equation that can be written in the form $M(x,y)dx + N(x,y)dy = 0$

B. A differential equation that can be written in the form $M(x,y,z)dx + N(x,y,z)dy + P(x,y,z)dz = 0$

C. A differential equation that can be written in the form $M(x,y)dy + N(x,y)dx = 0$

D. There is no such thing as an exact differential equation

25. What is an inexact differential equation?

A. A differential equation that can be written in the form $M(x,y)dx + N(x,y)dy = 0$

B. A differential equation that can be written in the form $M(x,y,z)dx + N(x,y,z)dy + P(x,y,z)dz = 0$

C. A differential equation that can be written in the form $M(x,y)dy + N(x,y)dx = 0$

D. There is no such thing as an inexact differential equation

1. C
2. A
3. B
4. B
5. A
6. A
7. B
8. A
9. A
10. A
11. A
12. A
13. A
14. A
15. B
16. A
17. B
18. A
19. B
20. A
21. A
22. A
23. A
24. A
25. A