**Math 1200 Sample Multiple Choice Questions**

1. 1 radian is

A) the arc length of a portion of a circle which is exactly one radius in length.

B) the angle subtended by an arc on a portion of the circle which is exactly one radius in length.

C) 57 degrees

D) 180 degrees

E) 3.14159...

2. The cotangent function *y* = cot(*x*) is undefined

A) when *x* equals *kπ*, where *k* is any integer

B) when *x* equals *π/2 + kπ*, where *k* is any integer

C) when *x* equals *kπ/2*, where *k* is any integer

D) when *x* equals *−kπ/2*, where *k* is any integer

E) never. The *y* = cot(*x*) is defined for all real numbers *x.*

3. The solution of  is

A)  B)  C) 

D)  E) 

4. The solution to the inequality 

A) (− ∞, −2] [−1, 3] B) (− ∞, −2]  [−1, 3)

C) (− ∞, −2]  (−1, 3) D) (− ∞, −2)  (−1, 3)

E) (− ∞, −2)  (−1, 3]

5. Which of the following is false?

A) 

B) |*a*| − *|b*|≤ | *a* − *b*|

C) 

D) 

E) 

6. If *x <* 0, then equals

A)  *x* B) − *x* C) − | *x|*  D) − |*x*2|

E) none of the above since is undefined for *x* < 0.

7. For which one of the following is it a **really bad idea** to solve by squaring both sides?

A)  B)  C) 

D)  E)   

8. The graph of *y = f*(*x*−2) is the graph of *y* = *f*(*x*) shifted

A) two units up

B) two units to the left

C) two units down

D) stretched by a factor of negative two

E) two units to the right

9**. ** equals

A) ∞ B) − ∞ C) 1/18 D) 1/27 E) 1/9

10.  equals

A) − 4/7 B) 4/7 C) 16/7 D) − ∞ E) ∞

11.  equals

A) −1/48 B) 1/48 C) 48 D) −48

E) The limit does not exist as it approaches ∞ from one side and − ∞ from the other.

12.  equals

A) 1/4 B) −1/4 C) 4 D) − 4 E) does not exist

13.  equals

A) 3B) 1/3 C) 0 D) − ∞ E) does not exist

14.  equals

A) − ∞ B) − 3/5 C) 3/5 D) − 9/5 E) ∞

15. Part 1: Find the value of the limit 

A) 19 B) 18 C) 6 D) 5 E) 17

15. Part 2: Find the value of the limit 

A) 17 B) 18 C) 6 D) 5 E) −17

16. The solution of [[*x*2]] = 80 is

A) 

B) 

C) 

D) 

E) 

17. In using the *ε /δ* definition to prove that when *ε* is 1/3, what is the largest value that *δ* can have?

A) 1/15 B) 1/5 C) 1/3 D) 5/3 E) 3/5

18. In using the *ε /δ* definition to prove that  when *ε* is 1/100, what is the largest value that *δ* can have?

A) 3/100 B) 1/300 C) 22/3 D) 1/10 E) 8/3

19. In proving an *ε /δ* limit, we find two restrictions on |*x − a*|:

0 < |*x −a*| < 1 and 0 < |*x −a*| <  *ε*/6. The best answer for *δ* is

A)  B)  C) 

D) 

E) There is not enough information. We need the original limit question.

20. Which of the following is the definition of ?

A) For every  > 0 there is an N > 0 such that if *x* < N then | *f*(*x*) – *L* | < .

B) For every  > 0 there is an *N* < 0 such that if 0 < |*x* − a| < *N* then | *f*(*x*) – *L |* < .

C) For every  > 0 there is an *N* < 0 such that if *x* > *N* then | *f*(*x*) – *L* | < .

D) For every  > 0 there is an N < 0 such that if *x* < *N* then | *f*(*x*) − *L* | < .

E) For every > 0 there is an *N* > 0 such that if *x* > *N* then | *f*(*x*) – *L* | < 

21. Which of the following is the definition of 

A) For every *N* > 0 there is an  > 0 such that if |*x* − *a|* > *N* then |*f*(*x*) − ∞| < .

B) For every *N* > 0 there is an  > 0 such that if 0 < |*x* − *a|* < *N* then |*f*(*x*) − ∞| < .

C) For every *N* > 0 there is an *δ* > 0 such that if 0 *< |x−a| <* *δ* then  *f*(*x*) > *N*.

D) For every *N* > 0 there is an *δ* > 0 such that if 0 *< |x* −*a*| < *δ* then *f*(*x*) < *N*.

E) For every *δ* > 0 there is an *N* > 0 such that if *x* > *δ* then *f*(*x*) > *N*.





23. The function has **essential** discontinuities at

A) *x* = −3, 3, 4 B) *x* = −3, 3 C) *x* = 3, 4 D) *x* = −3, 4

E) None of the above since all the discontinuities are removable.

24. 

A) *f* and *g* both have removable discontinuities at *x* = 3

B) *f* and *g* both have essential discontinuities at *x* = 3

C) *f* has a removable discontinuity and *g* has an essential discontinuity at *x* = 3

D) *f* has an essential discontinuity and *g* has a removable discontinuity at *x* = 3

E) *g* has an essential discontinuity at *x* = 3 and *f* is continuous at *x*=3

25. For the function 

to be **continuous at *x* = − 2**, the value of *A* must be

A) 12 B) 4 C) 0 D) −4

E) indeterminate. You need the value of *B* in order to determine the value of *A*.

26. For the function 

to be **differentiable at *x* = 1**, the value of B must be

A) 1 B) 2 C) 5 D) 6

E) indeterminate. You need the value of *A* in order to determine the value of *B*.

27. At what value(s) of *x* is the **not continuous**?

A) −1 B) 1 C) −1 and 1 D) − l, 0, and 1

E)  *f*  is continuous for every *x* .

28. At what value(s) of *x* is **not differentiable**?

A) −1 B) 1 C) −1 and 1 D) − l, 0, and 1

E) The function is differentiable for every *x* .

29. If *f*(*x*) = sec(*h*(*x*)), then *f* ʹ(*x*) equals

A) sec(*h*ʹ(*x*)) tan(*h*ʹ(*x*)) B) tan2(*h*(*x*)) *h*ʹ(*x*)

C) sec(*x*) tan(*x*) *h*(*x*) + *h*ʹ(*x*)sec(*x*) D) sec(*h*(*x*)) tan(*h*(*x*)) *h*ʹ(*x*)

E) (sec) (tan) *h*(*x*) + (sec) *h*ʹ(*x*)

30. If *f*(*x*) = cos( *g*(*x*)), then *f* ʹ(*x*) equals

A) cos(*g*ʹ(*x*)) B) sin(*x*) *g*ʹ(*x*)

C) − sin(*g*(*x*)) + *g*ʹ(*x*)cos(*g*(*x*) D) sin(*g*(*x*)) *g*ʹ(*x*) E) − sin(*g*(*x*)) *g*ʹ(*x*)

31. Let  *y* = *x*4 + 3*x*2 . Find the value of the differential *dy*, when *x* = 1, and *dx* = − 0.2. .

A) 10 B) 2 C) − 0.2 D) − 2 E) − 10

32. If 

A)  B)  C)  D)  E) 

33. 

A) There is not enough information. We need to be given *dy/dx* as well.

B) *dx/dt =* 20/3 at the point (3, 4)

C) *dx/dt =* −20/3 at the point (−3, 4)

D) *dx/dt =* 20/3 at the point (3, 4) and *dx/dt =* −20/3 at the point (−3, 4)

E)  *dx/dt =* 20/3 at the point (−3, 4) and *dx/dt =*  −20/3 at the point (3, 4)

34. To estimate  using differentials, choose

A) 

B) 

C) 

D) 

E) 

35. The first derivative with respect to *x* of *x*3 + *y*3 = 1 is *dy/dx* = −*x*2/*y*2. The second derivative with respect to *x*, *d*2*y/dx2* =

A) 

 B) 

C) 

D) 

E) 

36. Which of the statements below are true?

(1) Let *y* = *f*(*x*) be a continuous function with a ma*x*imum value at *x* = *c*.

Then *f* ʹ(*c*) = 0 or *f* ʹ(*c*) does not e*x*ist or (*c*, *f(c*)) is an end point.

(2) If *f* (*x*) is continuous on (*a,* *b*) then *f*(*x*) is differentiable on (*a*, *b*).

(3) If *f* (*x*) is differentiable on the open interval (*a*, *b*), and (*c*, f(*c*)) is a ma*x*imum point for some

*c* (*a*, *b*), then *f* ʹ(*c*) = 0.

A) Both (1) and (3) are true.

B) Both (2) and (3) are true.

C) Only (1) is true.

D) Only (3) is true.

E) All are true.

37. Consider the function  on the interval [−2, 3]. Note that

*f*(−2) = *f*(3) = 1. According to Rolle’s Theorem, there must be a number *c* in (−2, 3) such that *f* ʹ(*c*) is equal to a particular number *M*. The number *c* equals

A) either −1 or 2 B) −1/2 C) 0 D) 1/2 E) 1

38. Consider the function *f* (*x*) = *x*2 on the interval [1, 2]. According to the Mean Value Theorem, there must be a number *c* in the interval (1, 2) such that *f* ʹ(*c*) is equal to a particular number *M*. What are *c* and *M*?

A) *c =* 3/2 and *M* = 3 B) *c = * and  *M* = 3 C) *c =* 3 and *M* = 3/2

D)  *c* = and *M =* 3 E) 

39. According to Rolle’s Theorem, what is the number of real roots that the equation

*x*5 + 3*x* + *c* = 0 must have, where *c* is a constant?

A) 1 B) 2 C) 3 D) 4 E) 5

40. The equation of the normal to the curve *y* = 1*/x* at the point where *x =* 2 is given by

A)   B)  C) 

D)  E)  

41. Let . Then *f*(*x*) has

A) vertical asymptote *x* = −4/3 and horizontal asymptote *y* = 2/3.

B) vertical asymptote at *y* = −4/3 and horizontal asymptote *x* = 2/3.

C) vertical asymptote *x* = 2/3 and horizontal asymptote *y* = −4/3.

D) vertical asymptote *y* = 2/3 and horizontal asymptote *x* = 9/2.

E) vertical asymptote *y* = 2/3 and horizontal asymptote *x* = −4/3.

42. Let *f*(*x*) = . Then *f*(*x*) has

A) vertical asymptote *x* =and horizontal asymptote *y* = 5/2.

B) vertical asymptote *y* =and horizontal asymptote *x* = 5/2.

C) vertical asymptote *x* = 5/2 and horizontal asymptote *y* = −7.

D) vertical asymptote *x* = 5/2 and horizontal asymptote *y* = .

E) vertical asymptote at *x* = −7 and horizontal asymptote *x* = 5/2.

43. The function  has first and second derivatives 

The function is increasing on the intervals

A)  B) [−1, 0], [1, ∞) C)  (−∞, −1], [0, 1] D) [0, ∞) E) [0, 1], [1, ∞)

44. The function has first and second derivatives  The function has

A) a vertical tangent minimum at *x =*−1, a horizontal tangent maximum at *x =*0, a vertical tangent minimum at *x =*1.

B) a vertical tangent maximum at *x =*−1, a horizontal tangent minimum at *x =*0, a vertical tangent maximum at *x =*1.

C) an end point minimum at *x =* 1 only since the function is not defined for *x <* 1.

D) a horizontal tangent minimum at *x =*−1, a vertical tangent maximum at *x =*0, a horizontal tangent minimum at *x =*1.

E) a vertical tangent minimum at *x =*−1, a vertical tangent minimum at *x =*1, a point of inflection at *x* = 0.

45. The function  has first and second derivatives.  The function

A) is concave up on the intervals .

B) has points of inflection at 

C) is concave up on the intervals 

D)  is concave up on the interval [−1, 1].

E) has points of inflection only at *x* = −1 and  *x =* 1.

46. Geometrically, if *y* = *f*(*x*) is continuous, then

 measures from *x* = *a* to *x* = *b* and bounded by *y* = *f*(*x*)

A) the area above the *x* a*x*is

B) the area above the *x* a*x*is together with the area below the *x* a*x*is

C) the area above the *x* a*x*is minus the area below the *x* a*x*is

D) the average value of the function

E) none of the above; it depends on the function.

47. 

A)  B)  C) 

D)  E) 

48.  

A)  B)  C) 

D)  E) 

49. ∫ sec(*x*) tan(*x*) (1 + sec(*x*)) *dx* equals

A) (sec(*x*) tan(*x*))2 + *C*

 2

B) (1 + sec(*x*))2 + *C*

 2

C) 1 + (sec(*x*))2 + *C*

 2

D) (sec(*x*) tan(*x*))2 (1 + sec(*x*))2 + *C*

 4

E) (sec(*x*) tan(*x*))2 (1 + (sec(*x*))2) + *C*

 4

50.  equals

A)   B)  C) 

D)  E) 

51. ∫ ( cos3(*x*) −3cos1/2(*x*) + 5 ) sin(*x*) *dx* equals

A) − cos4(*x*)/4 + 9cos3/2(*x*)/2 −5cos(*x*) + C B) − cos4(*x*)/4 + 9cos3/2(*x*)/2 −5*x* + C

C) cos4(*x*)/4−2cos3/2(*x*) + 5cos(*x*) + C D) − cos4(*x*)/4 + 2cos3/2(*x*) −5cos(*x*) + C

E) − cos4(*x*)/4 + 2cos3/2(*x*) −5*x* + C

52. Which one of the following indefinite integrals **CANNOT** **be evaluated using**

**the “chain rule in reverse”.**

A)  B)  C) 

D)  E) 

53. The approximate  using four rectangles with equal subintervals and using *zi* to be the right endpoint of each subinterval is

A)  B) 7/4 C) 21/8 D) 3 E) 15/4

54. The approximate  using four rectangles with equal subintervals and using *zi* to be the left endpoint of each subinterval is

A) 1/2 B) 7/4 C) 21/8 D) 3 E) 15/4

55. If we approximate  using *n* equal subintervals and *zi* to be the left endpoint of each subinterval, then

A) 

B) 

C) 

D) 

E) 

56. In the proof of The Fundamental Theorem of Calculus, we defined 

With this definition of *A*(*x*), which of the following is false?

A) *A*(*a*) = 0

B)  *Aʹ* (*x*) = *f*(*x*)

C)  if *F* ʹ(*x*) = *f*(*x*), then 

D)  if *F*ʹ(*x*) = *f*(*x*), then *F*(*x*) = *A*(*x*)

E)  *Aʹ* (*b*) = *f*(*b*)

57. 

A)  B)  C)  D) ln(3.5) E) 3.5

58. Which of the following is false?

A) 

B) 

C) 



E) *e* = 2.7 1828 1828 459045 ...

59. 

A)  *f* ʹ(2sin(*x*) cos(*x*)) − *f* ʹ(1/*x*) B) 2sin(*x*) cos(*x*) *f*(sin2(*x*)) − (1/*x*) *f*(ln(*x*))

C) *f*(2sin(*x*) cos(*x*)) − *f*(1/*x*) D) *f* (sin2(*x*)) − *f* (ln*x*)

E) 2sin(*x*)cos(*x*) *f* ʹ(sin2(*x*)) − (1/*x*) *f* ʹ(ln*x*)

60. If equals

A) sin(*x*) − 1/*x* B) *f*(sin(*x*))cos(*x*) − *f*(ln(*x*))(1/*x*) C) *f*(sin(*x*)) − *f*(ln(*x*))

D)  *f* ʹ(sin(*x*)) − *f* ʹ(ln(*x*)) E) *f* ʹ(sin(*x*))cos(*x*) − *f* ʹ(ln(*x*))(1/*x*)

61. Let . Which of the following is false?

A)  B)   C) 

D)  E) 

62. Which of the following is false?

A)  B)  C) e ≐ 2.7 1828 1828 459045...

D) For b > 0,  E) 

63. Which of the following is false?

A) The domain of *y* = log(*x*) is [0,  ∞].

B) The range of *y* = log(*x*) is all real numbers.

C) 

D)  

E) 

64. Solve: If , then *x* equals

A) 2 B) *e* C) 2*e* D)   *e*2 E)    2*e*

65. The area of the region bounded by 

A)  B)  C) 

D)   E) 

66. The area of the region bounded by 

A) 

B) 

C) 

D)  

E) 

67. Let 

A)  B) 

C)  D) 

E) 

68. Let 

A) 

B) 

C) 

D) 

E)   

69. Consider the function *f* (*x*) = *x*3 on the interval [1, 3]. According to **The Mean Value Theorem for Integrals**, there is a number *c* in [1, 3] such that *f* (*c*) (which measures the average value of the function on the interval [1, 3] ) is equal to a particular number *M*. Then the value of *c* is

A) 101/3 B) 10 C)  D) 20 E) 201/3

70. The best way to study for this exam is

A) to just go into the exam room and write write write!

B) to glance over these questions on Tuesday, December 2 first and then go into...

C) to read the questions over a few times, despair of how many you can’t seem to do and then go into ...

D) to cheat on the exam, get caught, and ruin your life.

E) to find study partners and arrange several meeting times starting NOW and teach solutions to one another. Then study study study and ace the final!

Answers:

1-5: BAAEE 6-10: BBEDA 11-15(i &ii): BDCBDD 16-20: CABAD

21-25: CACCB 26-30: BEBDE 31-35: DAEDE 36-40: ADAAC

41-45: ADBAC 46-50: CEBBA 51-55: DDEBC 56-60: DEBBB

60-65: DEADD 66-69: CDCA

70. Do you have to ask?!?