

TEST BANK



EIGHTH EDITION
CALCULUS



Varberg Purcell Rigdon

Printed Test Bank

EIGHTH EDITION
CALCULUS

Varberg / Purcell / Rigdon

1. PRELIMINARIES	841
2. FUNCTIONS AND LIMITS	851
3. THE DERIVATIVE	872
4. APPLICATIONS OF THE DERIVATIVE	889
5. THE INTEGRAL	904
6. APPLICATIONS OF THE INTEGRAL	925
7. TRANSCENDENTAL FUNCTIONS	936
8. TECHNIQUES OF INTEGRATION	954
9. INDETERMINATE FORMS AND IMPROPER INTEGRALS	968
10. INFINITE SERIES	973
11. NUMERICAL METHODS, APPROXIMATIONS	992
12. CONICS AND POLAR COORDINATES	999
13. GEOMETRY IN THE PLANE, VECTORS	1019
14. GEOMETRY IN SPACE, VECTORS	1027
15. THE DERIVATIVE IN n -SPACE	1040
16. THE INTEGRAL IN n -SPACE	1052
17. VECTOR CALCULUS	1064
18. DIFFERENTIAL EQUATIONS	1074

1 Preliminaries

1. The sum of a rational number and an irrational number must be _____.

Answer: irrational

Difficulty: 2 Section: 1

2. Give an example of irrational numbers whose product is irrational and an example whose product is rational.

Answer: Varies. For the first question, $\sqrt{2}$ and $\sqrt{3}$ work, and for the second question $\sqrt{2}$ and $\sqrt{8}$ work.

Difficulty: 2 Section: 1

3. Find a rational number between $\frac{3}{4}$ and $\frac{4}{5}$.

Answer: Varies. The average is $\frac{31}{40}$.

Difficulty: 1 Section 2

4. Change the repeating decimal $1.163636363\dots$ to a ratio of two integers.

Answer: $\frac{64}{55}$.

Difficulty: 2 Section: 2

5. Find the best decimal approximation to $\frac{\sqrt{959} - 5^{2.3}}{5^4 - \sqrt{37.912}}$ that your calculator allows.

Answer: Depends on calculator. About -0.0154299 .

Difficulty: 2 Section 2

6. Find the solution set for the inequality $2x - 11 < 4x - 1$.

Answer: $(-5, \infty)$.

Difficulty: 1 Section: 3

7. Find the solution set for the inequality $5x - 11 < 15x - 22$.

Answer: $\left(\frac{11}{10}, \infty\right)$.

Difficulty: 1 Section: 3

8. Find the solution set for the inequality $3x - 10 > 5x + 2$.

Answer: $(-\infty, -6)$

Difficulty: 1 Section: 3

9. Find the solution set for the inequality $x^2 - 9x + 20 > 0$.

Answer: $(-\infty, 4) \cup (5, \infty)$.

Difficulty: 2 Section: 3

10. Find the solution set for the inequality $(x - 1)^2 \geq 16$.

Answer: $(-\infty, -3] \cup [5, \infty)$.

Difficulty: 2 Section: 3

11. Find the solution set for the inequality $x^2 + x - 2 < 0$.

Answer: $(-2, 1)$.

Difficulty: 2 Section: 3

12. Find the solution set for the inequality $x^2 - x - 8 < 4$.

Answer: $(-3, 4)$.

Difficulty: 2 Section: 3

13. Find the solution set for the inequality $(x - 5)(x - 2) \geq -2$.

Answer: $(-\infty, 3] \cup [4, \infty)$.

Difficulty: 2 Section: 3

14. Find the solution set for the inequality $\frac{x + 1}{x - 4} \leq 2$.

Answer: $(-\infty, 4) \cup [9, \infty)$.

Difficulty: 2 Section: 3

15. Find the solution set for the inequality $\frac{x + 1}{x - 6} < 0$.

Answer: $(-1, 6)$.

Difficulty: 2 Section: 3

16. Find the solution set for the inequality $\frac{x - 4}{x + 5} \leq 0$.

Answer: $(-5, 4]$.

Difficulty: 2 Section: 3

17. Find the solution set for the inequality $\frac{x+1}{4x-3} > 0$.

Answer: $(-\infty, -1) \cup \left(\frac{3}{4}, \infty\right)$.

Difficulty: 2 Section: 3

18. Find the solution set for the inequality $\frac{3x-2}{x-2} \leq 1$.

Answer: $[0, 2)$.

Difficulty: 2 Section: 3

19. Find the solution set for the inequality $\frac{(x-3)^2}{2x+1} > 0$.

Answer: $\left(-\frac{1}{2}, \infty\right)$.

Difficulty: 2 Section: 3

20. Find the solution set for the inequality $|3x+1| \leq 7$.

Answer: $\left[-\frac{8}{3}, 2\right]$.

Difficulty: 2 Section: 4

21. Find the solution set for the inequality $|10x+17| < 45$.

Answer: $\left(-\frac{31}{5}, \frac{14}{5}\right)$.

Difficulty: 2 Section: 4

22. Find the solution set for the inequality $|3x+16| < 8$.

Answer: $\left(-8, -\frac{8}{3}\right)$.

Difficulty: 2 Section: 4

23. Find the solution set for the inequality $|5x+17| < 7$.

Answer: $\left(-\frac{24}{5}, -2\right)$.

Difficulty: 2 Section: 4

24. Describe the interval $[-5, 5]$ by means of an inequality involving absolute values.

Answer: $|x| \leq 5$.

Difficulty: 1 Section: 4

25. Describe the interval $(0, 6)$ by means of an inequality involving absolute values.

Answer: $|x - 3| < 3$.

Difficulty: 1 Section: 4

26. Describe the interval $(-2, 4)$ by means of an inequality involving absolute values.

Answer: $|x - 1| < 3$.

Difficulty: 1 Section: 4

27. Find the distance between the points $(-1, 1)$ and $(2, -1)$.

Answer: $\sqrt{13}$.

Difficulty: 1 Section: 5

28. Find the distance between the points $(-4, 6)$ and $(-3, -1)$.

Answer: $5\sqrt{2}$.

Difficulty: 1 Section: 5

29. Find the distance between the points $(-5, -1)$ and $(3, 1)$.

Answer: $2\sqrt{17}$.

Difficulty: 1 Section: 5

30. Find the distance between the points $(3, 6)$ and $(1, -5)$.

Answer: $5\sqrt{5}$.

Difficulty: 1 Section: 5

31. Find the distance between the points $(1, -1)$ and $(3, 1)$.

Answer: $2\sqrt{2}$.

Difficulty: 1 Section: 5

32. Write the equation of the circle with radius 7 and center $(-3, 7)$.

Answer: $(x + 3)^2 + (y - 7)^2 = 49$.

Difficulty: 1 Section: 5

33. Write the equation of the circle with radius 1 and center $(0, 1)$.

Answer: $x^2 + (y - 1)^2 = 1$.

Difficulty: 1 Section: 5

34. Write the equation of the circle with radius 2 and center $(2, -3)$.

Answer: $(x - 2)^2 + (y + 3)^2 = 4$.

Difficulty: 1 Section: 5

35. Write the equation of the circle with radius $\frac{3}{4}$ and center $(0, 0)$.

Answer: $x^2 + y^2 = \frac{9}{16}$.

Difficulty: 1 Section: 5

36. Write the equation of the circle with radius 3 and center $(-1, 3)$.

Answer: $(x + 1)^2 + (y - 3)^2 = 9$.

Difficulty: 1 Section: 5

37. Write the equation of the circle with diameter AB for $A(-4, 2)$ and $B(2, -2)$.

Answer: $(x + 1)^2 + y^2 = 13$.

Difficulty: 2 Section: 5

38. Give the center and radius of the circle $2x^2 + 2y^2 = 4y - 6x - 6$.

Answer: $\left(-\frac{3}{2}, 1\right), \frac{1}{2}$.

Difficulty: 2 Section: 5

39. Give the center and radius of the circle $3x^2 + 3y^2 - 12x = 6 - 8y$.

Answer: $\left(2, -\frac{4}{3}\right), \frac{\sqrt{70}}{3}$.

Difficulty: 2 Section: 5

40. Give the center and radius of the circle $3x^2 + 3y^2 - 12x + 78y + 492 = 0$.

Answer: $(2, -13), 3$.

Difficulty: 2 Section: 5

41. Show that the locus of $x^2 + y^2 - 2x + 2y + 2 = 0$ is a degenerate circle.

Answer: The equation is $(x - 1)^2 + (y + 1)^2 = 0$.

Difficulty: 2 Section: 5

42. Show that the locus of $x^2 + y^2 + 2x - 2y + 7 = 0$ is empty.

Answer: The equation is $(x + 1)^2 + (y - 1)^2 = -5$.

Difficulty: 2 Section: 5

43. Write the equation of the line through the points $(0, 1)$ and $(2, 3)$.

Answer: $y = x + 1$.

Difficulty: 1 Section: 6

44. Write the equation of the line through the points $(-3, 2)$ and $(0, 3)$.

Answer: $y = \frac{1}{3}x + 3$.

Difficulty: 1 Section: 6

45. Write the equation of the line through the points $(2, -3)$ and $(1, -2)$.

Answer: $y = -x - 1$.

Difficulty: 1 Section: 6

46. Write the equation of the line through the points $(0, 3)$ and $(1, 0)$.

Answer: $y = -3x + 3$.

Difficulty: 1 Section: 6

47. What is the slope of the line with equation $2x - 3y = 5$?

Answer: $m = \frac{2}{3}$.

Difficulty: 1 Section: 6

48. What is the slope of the line with equation $\frac{x}{5} + \frac{y}{4} = 5$?

Answer: $m = -\frac{4}{5}$.

Difficulty: 1 Section: 6

49. What is the slope of the line with equation $-3x + 4y = 7$?

Answer: $m = \frac{3}{4}$.

Difficulty: 1 Section: 6

50. What is the slope of the line with equation $\frac{x}{2} + \frac{y}{3} = 2$?

Answer: $m = -\frac{3}{2}$.

Difficulty: 1 Section: 6

51. Find the equation of the vertical line passing through $(3, 2)$.

Answer: $x = 3$.

Difficulty: 1 Section: 6

52. Find the equation of the vertical line passing through $(-1, 0)$.

Answer: $x = -1$.

Difficulty: 1 Section: 6

53. Find the equation of the vertical line passing through $(-6, 7)$.

Answer: $x = -6$.

Difficulty: 1 Section: 6

54. Write an equation of the line that is parallel to $-3x - 2y + 2 = 0$ and that passes through $(4, 3)$.

Answer: $y = -\frac{3}{2}x + 9$.

Difficulty: 2 Section: 6

55. Write an equation of the line that is parallel to $2y - 3x = 0$ and that passes through $(-4, -7)$.

Answer: $y = \frac{3}{2}x - 1$.

Difficulty: 2 Section: 6

56. Write an equation of the line that is parallel to $-3x + y = 0$ and that passes through $(\frac{1}{3}, -2)$.

Answer: $y = 3x - 3$.

Difficulty: 2 Section: 6

57. Write an equation of the line that is parallel to $x - 3y = 3$ and that passes through $(6, -5)$.

Answer: $y = \frac{1}{3}x - 7$.

Difficulty: 2 Section: 6

58. Write an equation of the line perpendicular to $5x + 2y = -4$ and passing through $(9, -4)$.

Answer: $y = \frac{2x}{5} - \frac{38}{5}$.

Difficulty: 2 Section: 6

59. Write an equation of the line perpendicular to $\frac{x}{8} + \frac{y}{2} = 1$ and passing through $(-5, 4)$.

Answer: $y = 4x + 24$.

Difficulty: 2 Section: 6

60. Write an equation of the line perpendicular to $2x + 3y = 7$ and passing through $(4, 7)$.

Answer: $y = \frac{3}{2}x + 1$.

Difficulty: 2 Section: 6

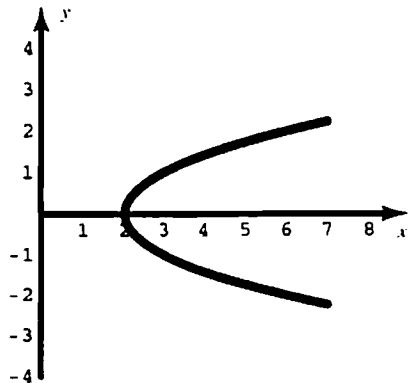
61. Write an equation of the line perpendicular to $-3x = 7y + 2$ and passing through $(3, 1)$.

Answer: $\frac{7}{3}x - 6$.

Difficulty: 2 Section: 6

62. Sketch the graph of $x = 2 + y^2$.

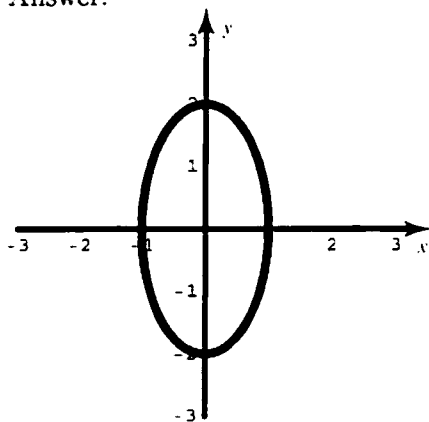
Answer:



Difficulty: 1 Section: 7

63. Sketch the graph of $4x^2 + y^2 = 4$.

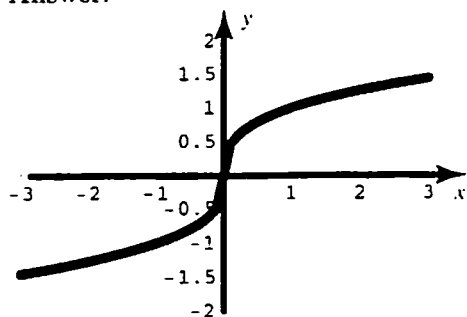
Answer:



Difficulty: 2 Section: 7

64. Sketch the graph of $y = \sqrt[3]{x}$.

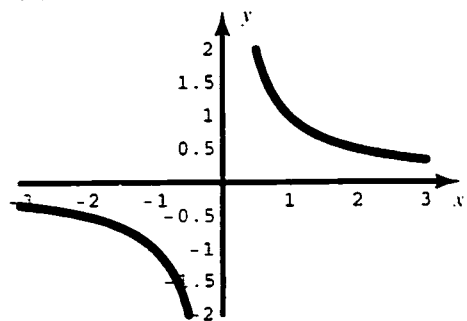
Answer:



Difficulty: 2 Section: 7

65. Sketch the graph of $y = \frac{1}{x}$.

Answer:



Difficulty: 2 Section: 7