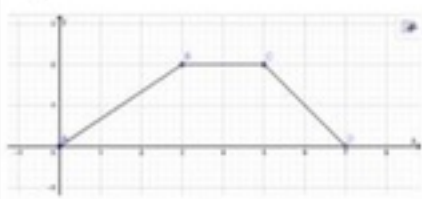




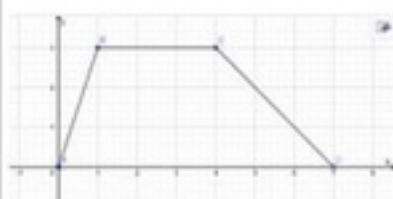
ИНДИВИДУАЛЬНОЕ ДОМАШНЕЕ ЗАДАНИЕ «КРАТНЫЕ ИНТЕГРАЛЫ»

 Задача. Вычислить двойной интеграл по области D , изображённой на рисунке. Найти площадь трапеции тремя способами.

1. $\iint_D (2x - 3y) dx dy$



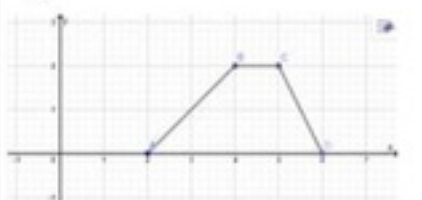
2. $\iint_D (4x + y) dx dy$



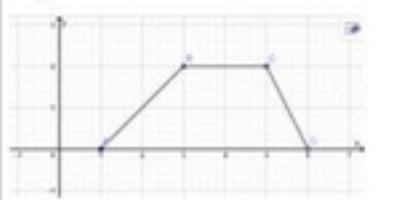
3. $\iint_D (4x + 2y) dx dy$



4. $\iint_D (2x - 4y) dx dy$



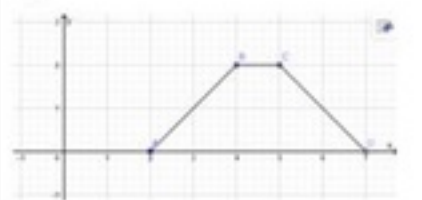
5. $\iint_D (2x + 3y) dx dy$



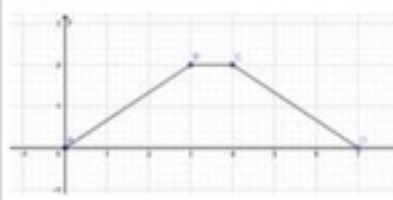
6. $\iint_D (4x + 3y) dx dy$



7. $\iint_D (2x - 5y) dx dy$



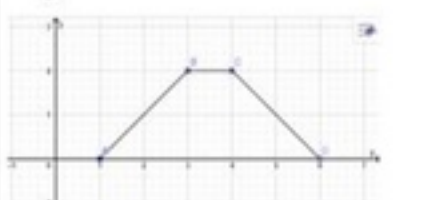
8. $\iint_D (2x + 4y) dx dy$



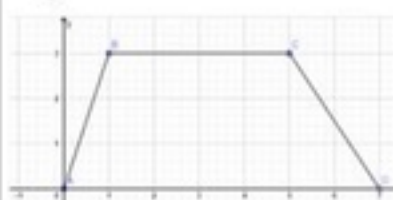
9. $\iint_D (4x + 4y) dx dy$



10. $\iint_D (2x - 6y) dx dy$



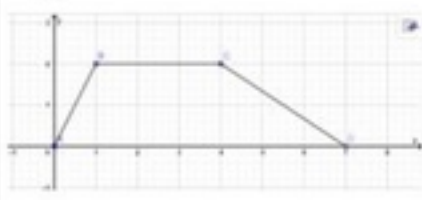
11. $\iint_D (4x + 5y) dx dy$



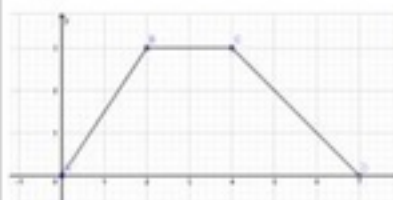
12. $\iint_D (4x + 6y) dx dy$



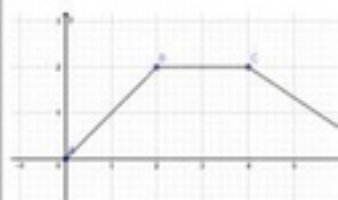
13. $\iint_D (2x - 7y) dx dy$



14. $\iint_D (4x + 7y) dx dy$



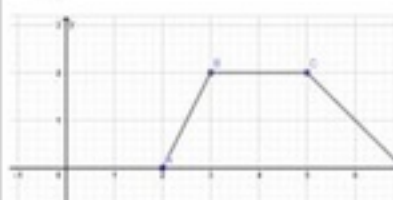
15. $\iint_D (2x + 5y) dx dy$



16. $\iint_D (2x - 8y) dx dy$

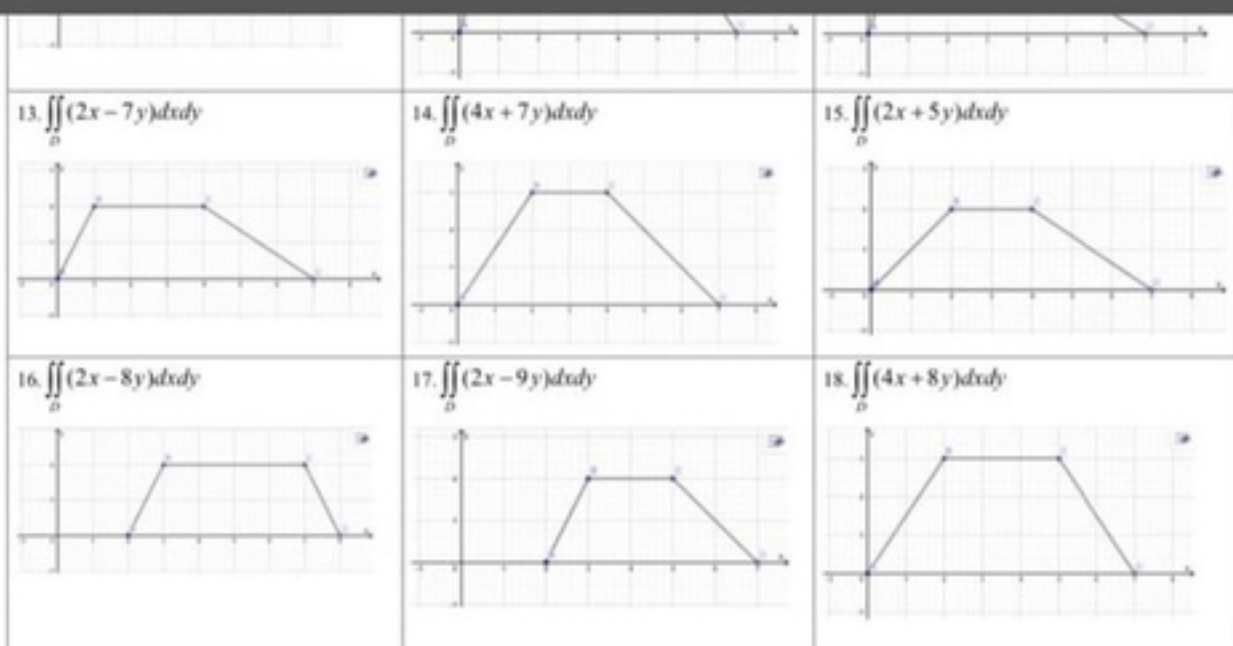


17. $\iint_D (2x - 9y) dx dy$

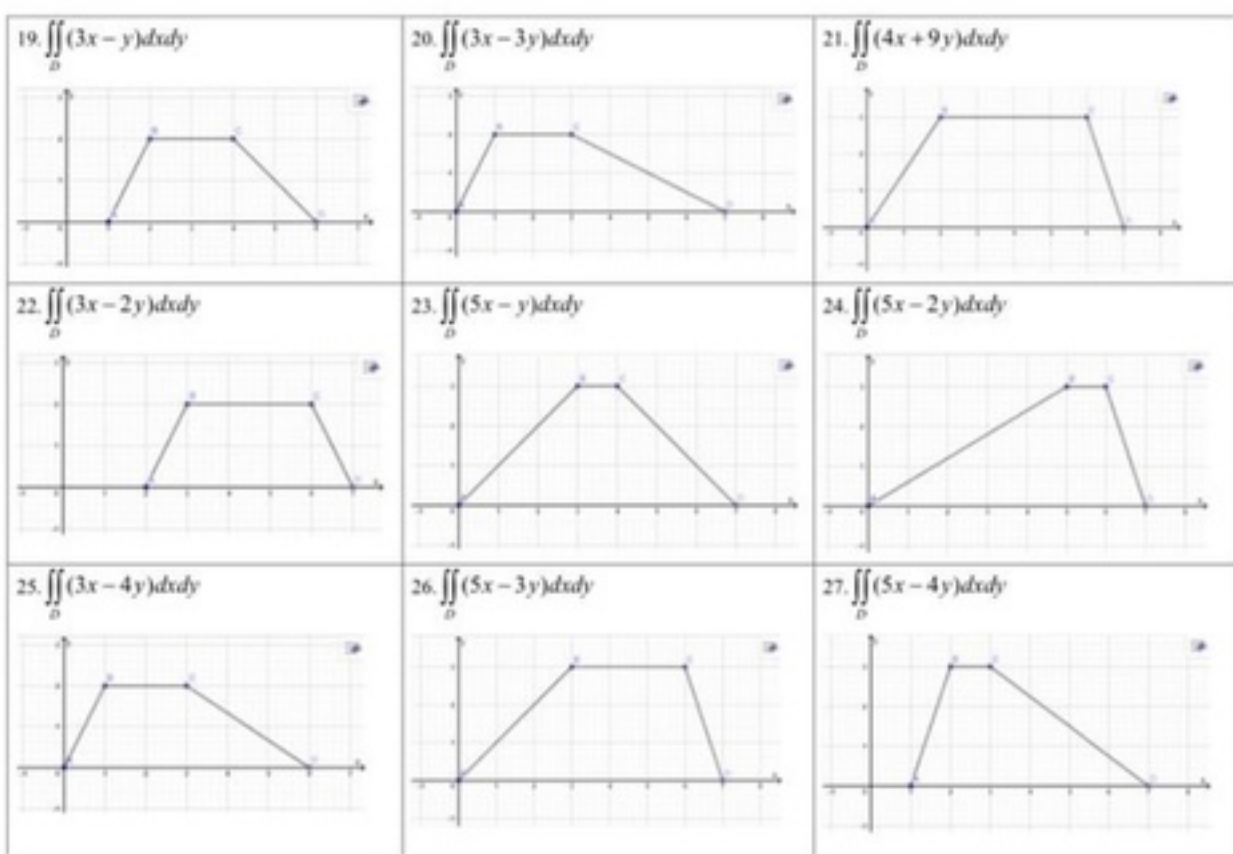


18. $\iint_D (4x + 8y) dx dy$

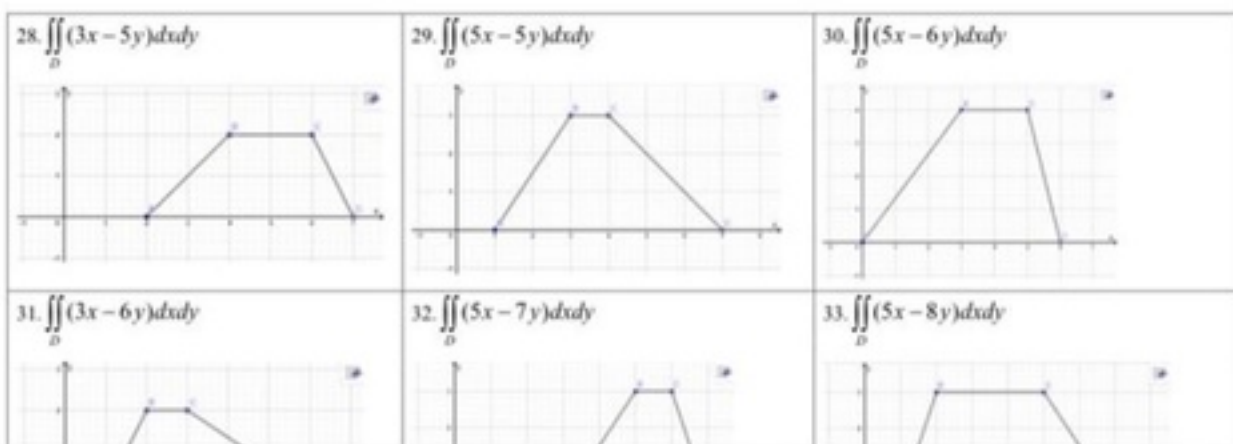




2



3





Варианты индивидуального задания

Произведены десять измерений двумерной случайной величины (X, Y) . Результаты представлены в таблице.

| | | | | |
|-----|-------|-------|---------|----------|
| X | x_1 | x_2 | \dots | x_{10} |
| Y | y_1 | y_2 | \dots | y_{10} |

Необходимо:

1. Составить уравнения прямой, параболы и гиперболы, построить найденные линии на графике.
2. Сделать выводы о кривой наилучшего приближения.

1 вариант

| | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| x_i | 2.1 | 6.5 | 2.9 | 3.0 | 2.6 | 2.0 | 1.4 | 6.8 | 3.7 | 2.1 |
| y_i | 1.4 | 2.2 | 1.7 | 2.0 | 1.7 | 1.0 | 0.5 | 2.6 | 2.1 | 1.6 |

2 вариант

| | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| x_i | 1.6 | 1.5 | 3.3 | 4.1 | 1.8 | 1.4 | 6.5 | 5.5 | 1.6 | 5.1 |
| y_i | 1.1 | 0.6 | 2.1 | 2.4 | 1.0 | 0.4 | 2.2 | 2.6 | 1.1 | 2.4 |

3 вариант

| | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| x_i | 3.1 | 7.0 | 6.7 | 4.8 | 1.9 | 3.7 | 1.3 | 5.5 | 4.9 | 2.4 |
| y_i | 2.2 | 2.7 | 2.6 | 2.3 | 1.4 | 2.2 | 0.4 | 2.4 | 2.5 | 1.5 |

4 вариант

| | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| x_i | 6.4 | 1.3 | 5.3 | 4.3 | 1.7 | 5.6 | 2.9 | 1.9 | 3.0 | 4.6 |
| y_i | 4.4 | 9.1 | 4.1 | 4.4 | 7.8 | 4.2 | 5.4 | 6.8 | 5.4 | 4.7 |

5 вариант

| | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|
| x_i | 1.7 | 3.5 | 7.0 | 1.2 | 1.7 | 3.0 | 1.1 | 5.7 | 5.7 | 4.7 |
| y_i | 7.2 | 5.2 | 3.9 | 9.4 | 7.5 | 5.8 | 10.3 | 4.5 | 4.1 | 4.5 |



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| | | | | | | | | | | |
|-------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|
| | 2.8 | 0.6 | 3.8 | 2.7 | 2.2 | 3.5 | 2.2 | 2.9 | 3.1 | |
| y_i | 1.1 | 4.2 | 0.6 | 10.9 | 4.9 | 3.0 | 5.7 | 2.9 | 3.5 | 6.3 |

23 вариант

| | | | | | | | | | | |
|-------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|
| x_i | 4.8 | 2.5 | 1.5 | 1.2 | 4.0 | 1.0 | 2.7 | 2.8 | 4.0 | 3.2 |
| y_i | 17.2 | 5.5 | 1.0 | 1.9 | 8.6 | 2.0 | 4.5 | 4.6 | 11.1 | 7.4 |

24 вариант

| | | | | | | | | | | |
|-------|------|------|-----|------|------|------|------|------|------|------|
| x_i | 4.3 | 1.7 | 0.3 | 2.6 | 2.9 | 4.6 | 1.1 | 4.6 | 3.0 | 3.2 |
| y_i | 20.4 | 18.7 | 4.6 | 27.0 | 24.1 | 19.0 | 13.4 | 24.0 | 27.5 | 27.4 |

25 вариант

| | | | | | | | | | | |
|-------|------|------|------|------|------|------|------|------|------|------|
| x_i | 1.6 | 3.1 | 3.8 | 4.0 | 4.1 | 2.8 | 2.7 | 4.6 | 1.4 | 2.3 |
| y_i | 27.6 | 40.9 | 45.4 | 46.7 | 47.4 | 39.6 | 37.4 | 43.6 | 24.7 | 37.1 |

26 вариант

| | | | | | | | | | | |
|-------|-----|------|-----|------|------|------|------|-----|-----|------|
| x_i | 5.0 | 1.8 | 4.5 | 2.8 | 2.1 | 1.4 | 1.9 | 4.9 | 4.8 | 1.5 |
| y_i | 1.0 | 15.6 | 5.9 | 17.7 | 14.8 | 13.0 | 13.1 | 1.7 | 2.9 | 10.7 |



Очно-заочное отделение. Математика.

ИНДИВИДУАЛЬНОЕ ДОМАШНЕЕ ЗАДАНИЕ «ДИФФЕРЕНЦИАЛЬНЫЕ УРАВНЕНИЯ»

| № | Задание 1. Найти общее решение дифференциального уравнения. | Задание 2. Найти общее решение линейного однородного дифференциального уравнения |
|-----|---|--|
| 1. | $xy' = 2y$ | $y'' + y = 0$ |
| 2. | $y' - e^y = 0$ | $y'' + 4y = 0$ |
| 3. | $xy' + y = 0$ | $y'' + 9y = 0$ |
| 4. | $xy' - y = 1$ | $y'' + 16y = 0$ |
| 5. | $y' = e^{x+y}$ | $y'' + 25y = 0$ |
| 6. | $(1+x^2)(1+y)y' - xy = 0$ | $y'' + y' = 0$ |
| 7. | $y' = (3x^2 + 2x)(1+y^2)$ | $y'' + 2y' = 0$ |
| 8. | $xyy' = 1 + x^2$ | $y'' + 3y' = 0$ |
| 9. | $y' = x\sqrt{1-y^2}$ | $y'' + 4y' = 0$ |
| 10. | $(x+1)y' + xy = 0$ | $y'' + 5y' = 0$ |
| 11. | $2\sqrt{xy} - y = 0$ | $y'' + 2y' + y = 0$ |
| 12. | $e^{-x}y' = 1$ | $y'' + 4y' + 4y = 0$ |
| 13. | $y'\sqrt{1-x^2} = 1 + y^2$ | $y'' + 6y' + 9y = 0$ |
| 14. | $2y - xy' = 0$ | $y'' + 8y' + 16y = 0$ |
| 15. | $y' = (x^2 - x)(1 + y^2)$ | $y'' + 10y' + 25y = 0$ |
| 16. | $(1 + e^x)yy' = e^x$ | $y'' - 3y' + 2y = 0$ |
| 17. | $y \ln y + xy' = 0$ | $y'' - 4y' + 3y = 0$ |
| 18. | $y'\sqrt{1+x^2} - x = 0$ | $y'' - 5y' + 4y = 0$ |
| 19. | $(1+x^2)y' = y + x^2y$ | $y'' - 6y' + 5y = 0$ |
| 20. | $y' = -\frac{xy}{x+1}$ | $y'' + 3y' + 2y = 0$ |
| 21. | $e^{-y}y' = 1$ | $y'' - 4y' + 3y = 0$ |
| 22. | $y' = -\frac{y \ln y}{x}$ | $y'' + 5y' + 4y = 0$ |
| 23. | $(1+x^2)y' = y + x^2y$ | $y'' + 6y' + 5y = 0$ |
| 24. | $y' - \frac{y}{x} = \frac{1}{x}$ | $y'' + 7y' + 6y = 0$ |
| 25. | $y'\sqrt{1+x^2} - x = 0$ | $y'' + 8y' + 7y = 0$ |
| 26. | $xy' = 2y^2$ | $y'' - 6y' + 9y = 0$ |
| 27. | $2y^3 - xy' = 0$ | $y'' - 5y' + 6y = 0$ |
| 28. | $xy' + 3y = 0$ | $y'' - 8y' + 7y = 0$ |
| 29. | $e^{-x}y' = 10$ | $y'' - 10y' + 25y = 0$ |
| 30. | $y' - \frac{2y}{x} = \frac{1}{x}$ | $y'' - 4y' + 4y = 0$ |



Дана функция трёх переменных $u = u(x, y, z)$. Найти все частные производные первого и второго порядка.

| | | | |
|----|---------------------------------|----|--|
| 1 | $u = \frac{x^2}{2y - 3z}$ | 2 | $u = 2xe^{yz}$ |
| 3 | $u = x^2 \sin \sqrt{y + z}$ | 4 | $u = \ln(x + y^2 - 2z)$ |
| 5 | $u = xy \cos \sqrt{z}$ | 6 | $u = x \sin z \cos y$ |
| 7 | $u = ye^{x+z}$ | 8 | $u = \frac{x - y}{\sin z}$ |
| 9 | $u = \frac{y + 2z}{\ln(z - x)}$ | 10 | $u = xy \operatorname{tg} \sqrt{z}$ |
| 11 | $u = \ln(x + 3y - z^3)$ | 12 | $u = y^2 \sin \sqrt{x - z}$ |
| 13 | $u = \frac{z + y}{\sin x}$ | 14 | $u = yz^2 \operatorname{ctg}(2x + 1)$ |
| 15 | $u = \frac{z^2}{2y + x}$ | 16 | $u = xy^2 \operatorname{ctg}(z + 1)$ |
| 17 | $u = x \ln(2y - 3z)$ | 18 | $u = z \sin y \cos 2x$ |
| 19 | $u = xz \cos \sqrt{y + 1}$ | 20 | $u = \ln(x^2 + y^2 + z)$ |
| 21 | $u = \frac{2x + y}{\cos z}$ | 22 | $u = \frac{x + 2y}{\ln(z - x)}$ |
| 23 | $u = z^3 \ln(2x + y)$ | 24 | $u = x^2 z \operatorname{tg} \sqrt{y}$ |
| 25 | $u = \frac{y^2}{x - 3z}$ | 26 | $u = z \sin x \cos y$ |