**Контрольная работа №2**

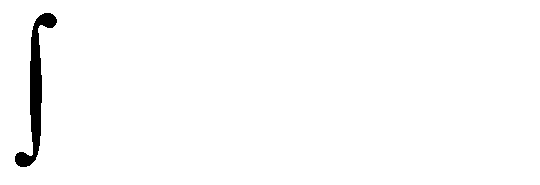
**Требования:**

**Каждый студент получает один вариант (из 10) контрольной работы – по последней цифре зачетки ( 0 соответствует 10 варианту).**

**Формулировку каждого задания обязательно записывать до начала решения.**

**Расчеты производить от руки, выполненную контрольную работу высылать в сканированном виде, добавив титульный лист.**

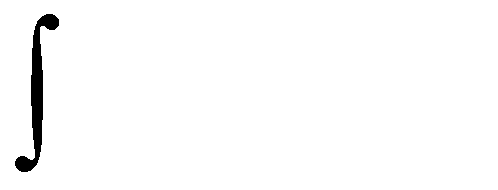
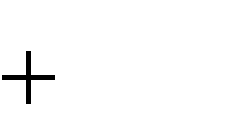
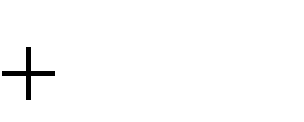
# Найти неопределѐнный интеграл.



sin ln *x*

*dx*

*x*



*x* 1

*dx*

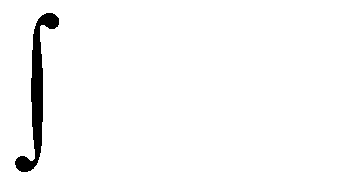
*x*2

1

* 1. а)
  2. а)

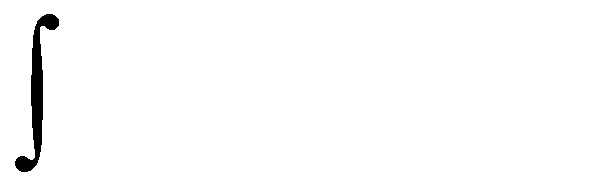
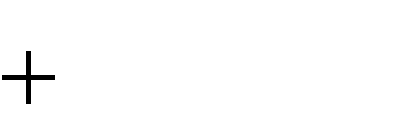
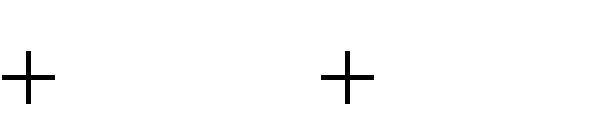
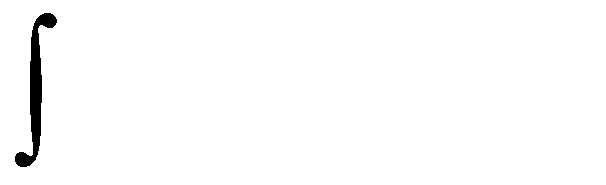
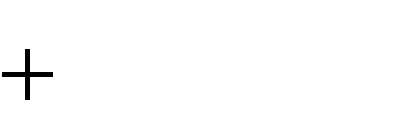
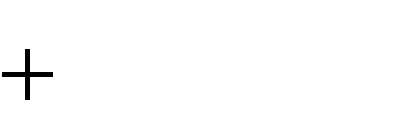
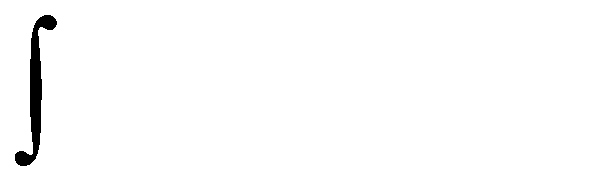
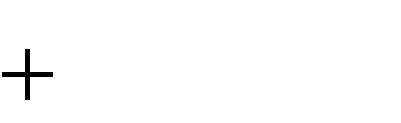
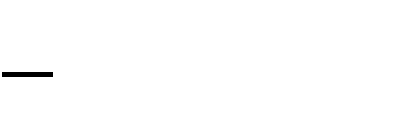
8*xdx* ;

sin2 *x*2



; б) .

* 1. а) cos *xdx* ; *x* .



б)

*x*

*arctg x*

4

1

*x*2

*dx* .

б)

1

2 sin *x* cos *x*

1 sin2 *x*

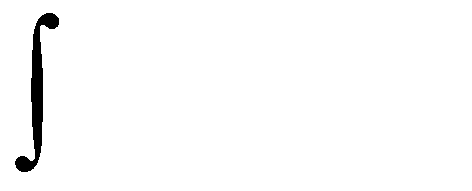
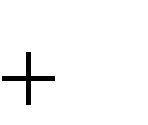
*d*

)

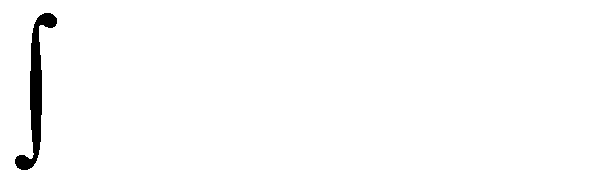
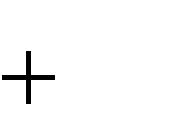
1 ln2 *x* 1

1 *x*

*dx* .



3sin *x* 2

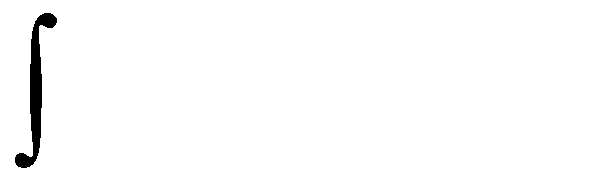
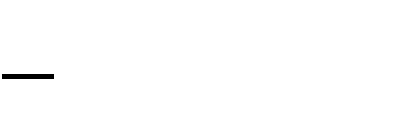


*xdx*

cos2 3*x*2 7

* 1. а) ; б

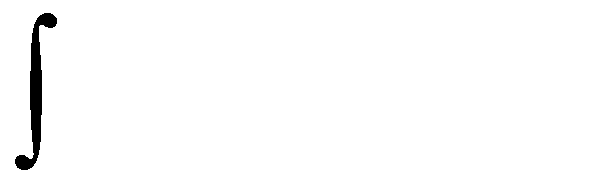
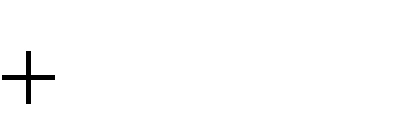
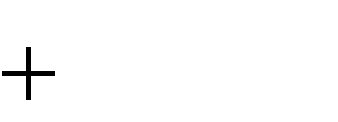
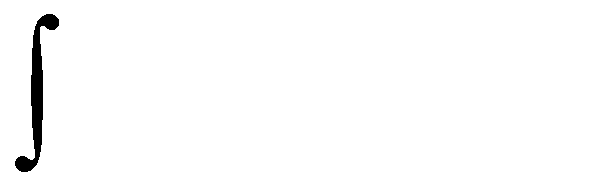
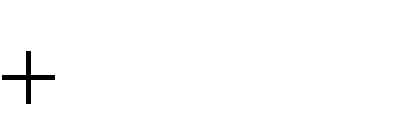
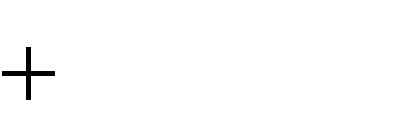
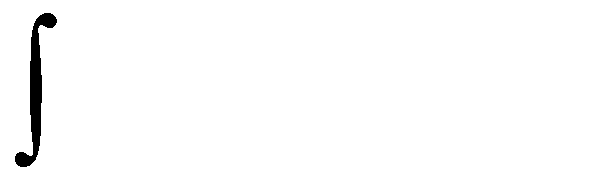
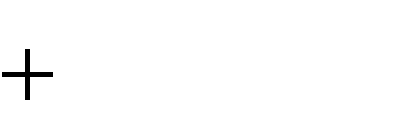
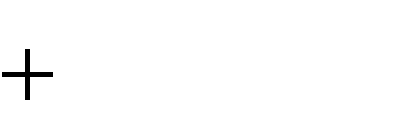
5) а) ;



3 *ctg x*

*dx*

sin2 *x*



б)

2*x arctg* 2 *x*

1

*x*2

*dx* .

б)

cos *x* sin 2*x dx* .

б)

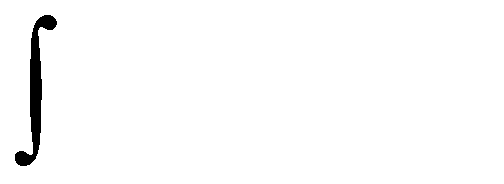
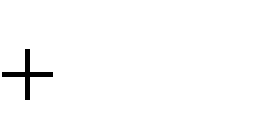
1 sin2 *x*

ln *x* 1

*x* 9 ln2 *x*

*dx* .

6) а) ;



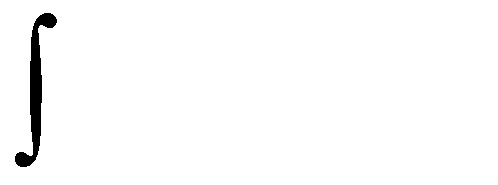
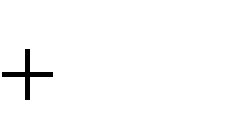
*dx*

2*x*3

3 *x*4

3

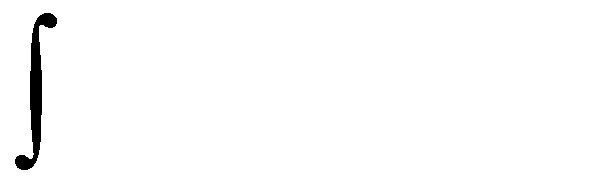
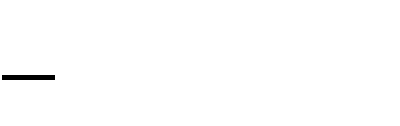
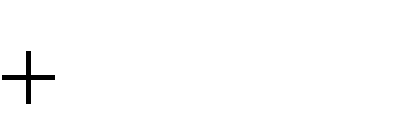
7) а) ;



*dx*

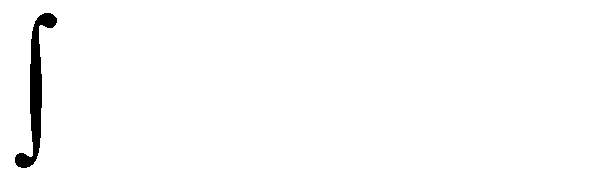
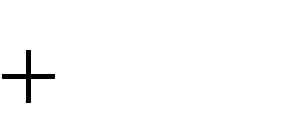
*x* 5 ln *x*

3 2 arcsin 3*x*



8) а)

1 9*x*2

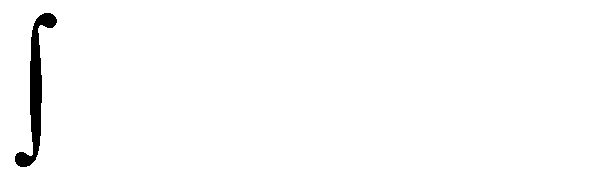
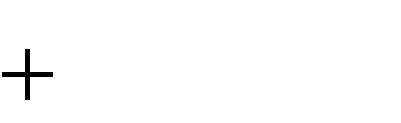
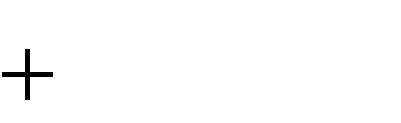


*tg x dx*

cos2 *x tg x* 2

9) а)

*dx* ;



б)

*x*2

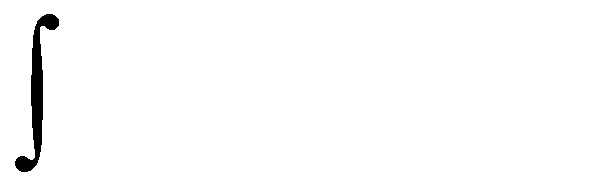
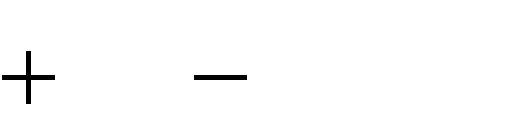
1

*arctg* 2 *x*

*x*2

*dx* .

; б) .



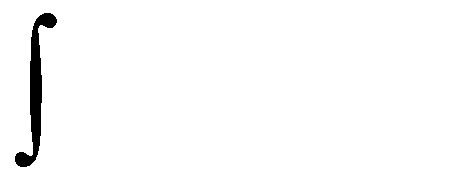
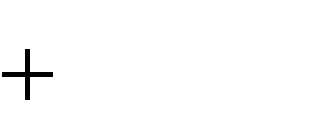
*x*2

1 ln *x*

*x*

*dx*

10) а) ;

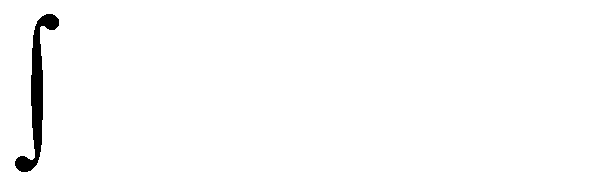
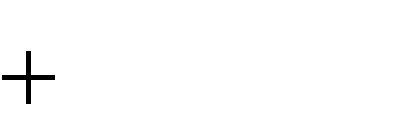
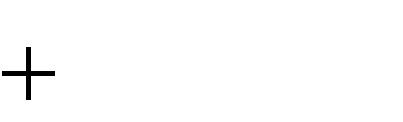


4

3*x*

32 *x*

*dx*



б)

sin *x* sin 2*x dx* .

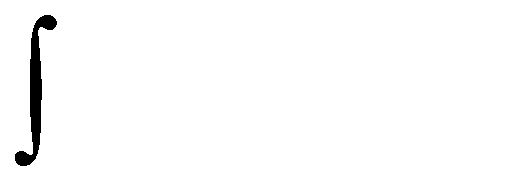
1 cos2 *x*

# Вычислить определѐнный интеграл.

* 1. а)
  2. а)

; б)

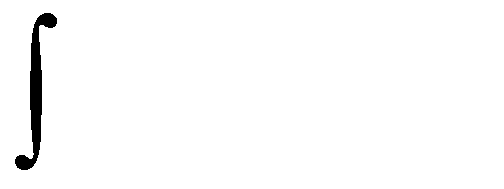
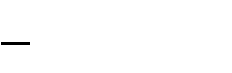
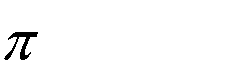
; б)



3

*x*2 cos 3*xdx*

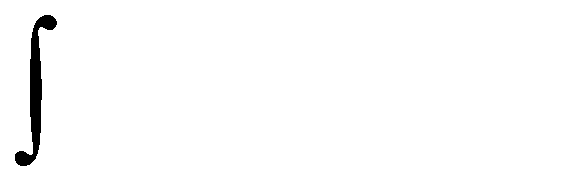
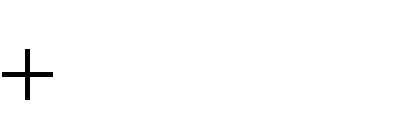
0



*e x* cos *xdx*

.

2*arctg* 2 *dx*



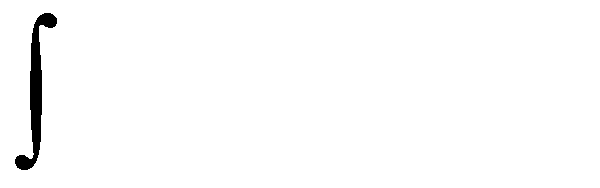
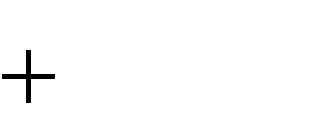
2

sin *x*

5 3sin *x*

*dx*

0

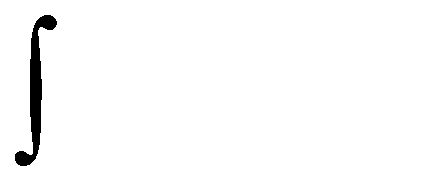


sin2 *x* 1 cos *x*

0

2

* 1. а)

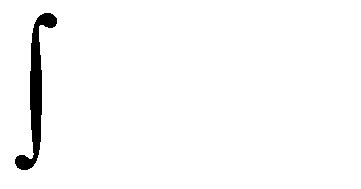


*e*

*x* ln2 *xdx*

1

* 1. а)



1

*x*2 2*x dx*

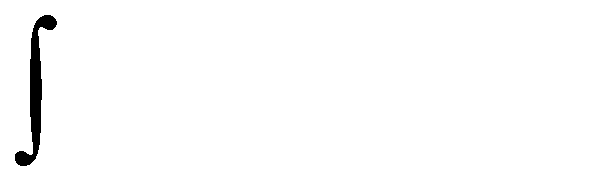
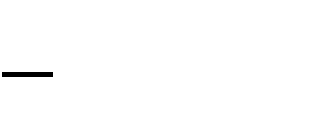
0

; б)

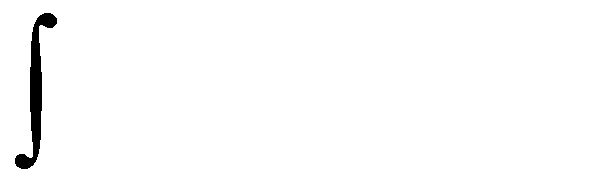
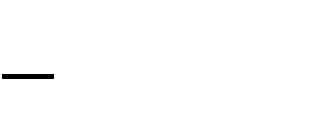
; б)

2*arctg* 2

2



2*arctg* 1



2

*dx*

sin2 *x* 1 sin *x*

2*arctg* 1

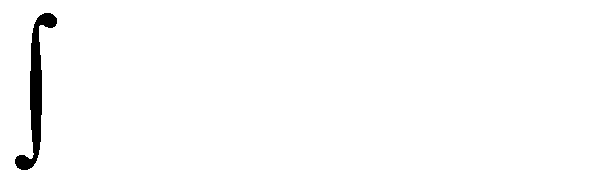
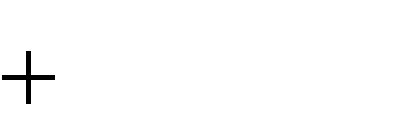
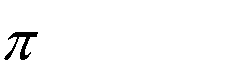
4

*dx* .

sin2 *x* 1 cos *x*

.

5) а) *x* ; б) .

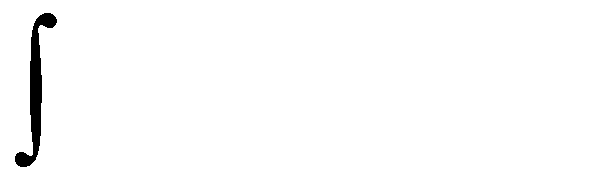
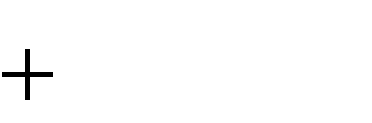


1

*x*2

cos *xd*

0



2

cos *xdx*

1 cos *x*

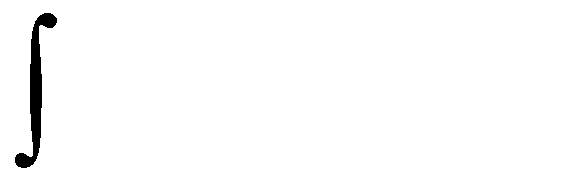
3

2*arctg* 1

1. а)
2. а)

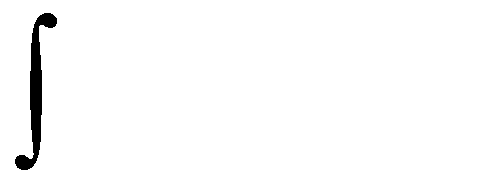
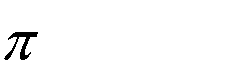
*e*

cos ln *x dx* ; б)



1

; б)

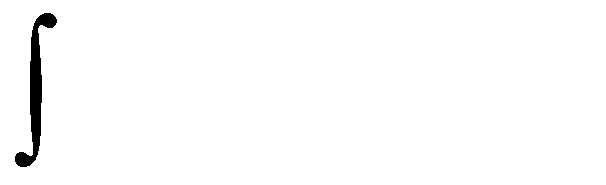
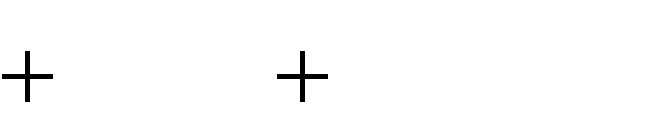


*e*3*x* sin *xdx*

0

2

.



2

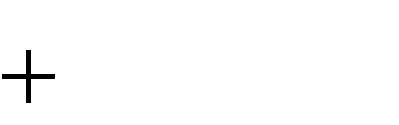
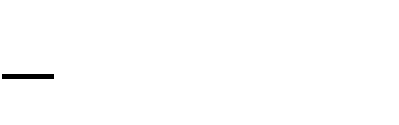
sin *xdx*

1 sin *x* cos *x*

2

0

2*arctg* 1



2

1 sin *x*

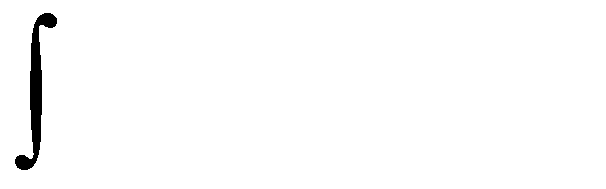
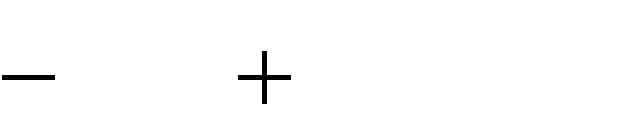
cos *x* 1 cos *x*

*dx*

0

.

8) а) ; б) .

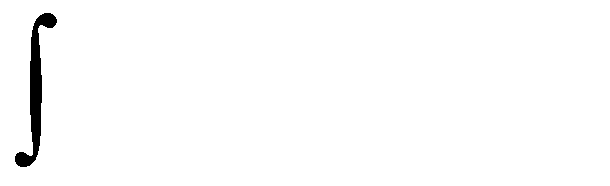
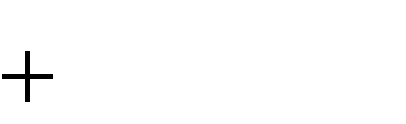
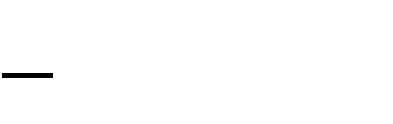


1

*x*3

2*x*2 5 *e*3 *xdx*

0



2 cos *x* sin *x*

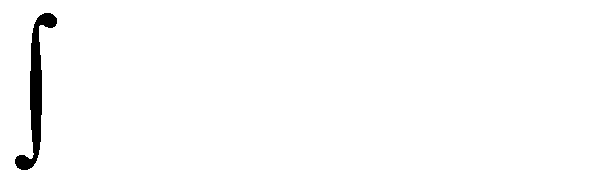
*dx*

0

1 sin *x*

2

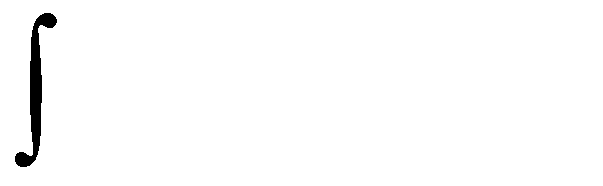
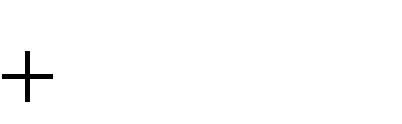
1



arcsin *x dx*

2

0



2

б)

0

sin *x*

1 cos *x*

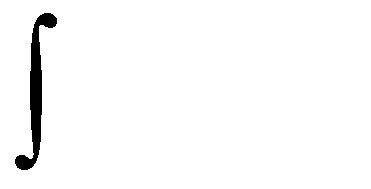
2 *dx* .

9) а) ;

10) а)

1

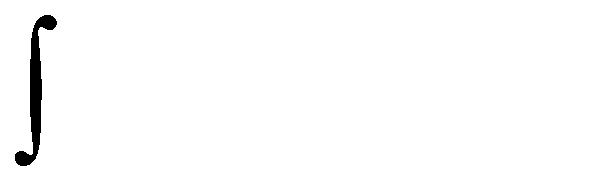
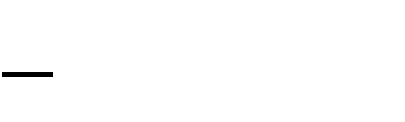
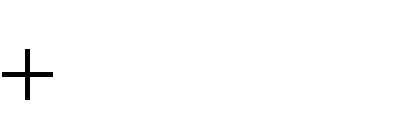
ln2 *xdx* ; б)



*e* 1

2*arctg* 1

2



0

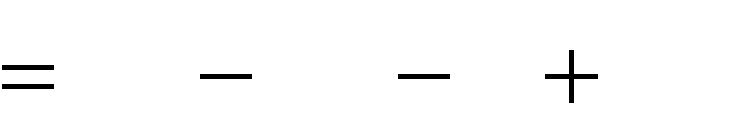
1 sin *x*

1 sin *x*

2

*dx* .

1. **Найдите экстремумы функции двух переменных** *f* (*x*, *y*)
   1. *z*

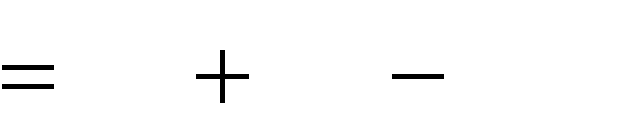


*xy*

*y*2

*x* 6 *y*

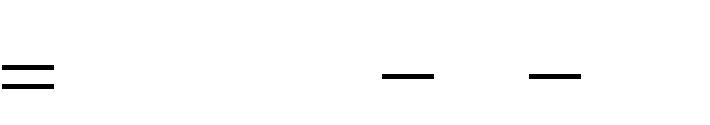
* 1. *z*



*x*3 *y*3

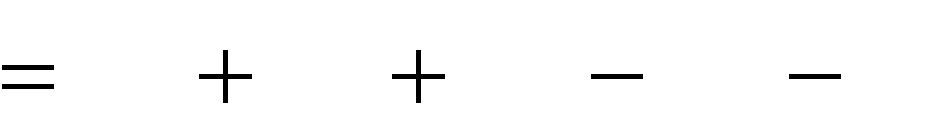
3*xy*

* 1. *z*



*x*3 *y*2 (6 *x y*)

* 1. *z*



*x*2

*xy*

*y*2

2*x*

*y*

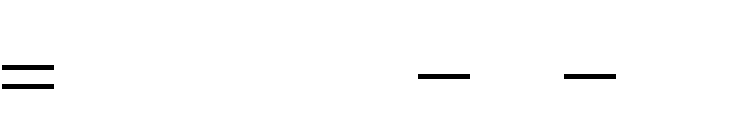
* 1. *z*



*ey x*2

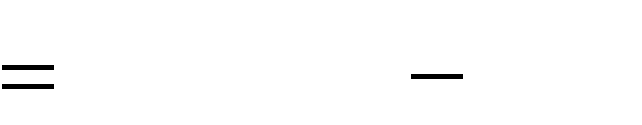
*y*

* 1. *z*



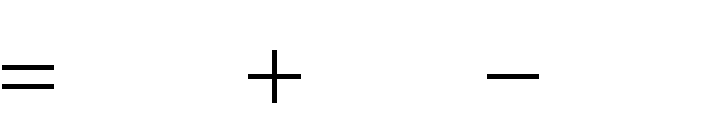
*x*3 *y*2 (12 *x y*)

* 1. *z*



*e*2 *y* (3*x*2 4 *y*)

* 1. *z*



2*x*3 *xy*2 16*x*

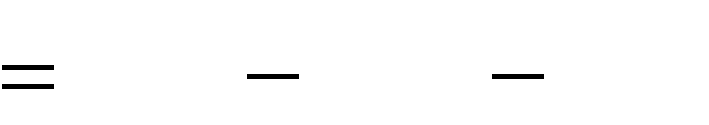
* 1. *z*



*x*3

3*xy*2 15*x* 12 *y*

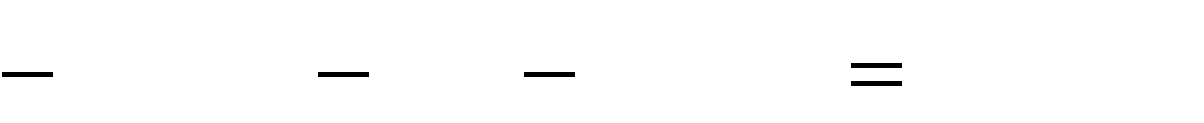
* 1. *z*



3*xy x*2 *y xy*2

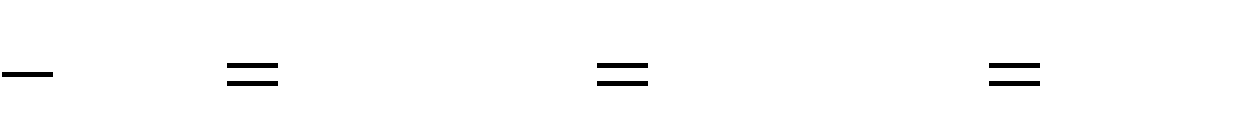
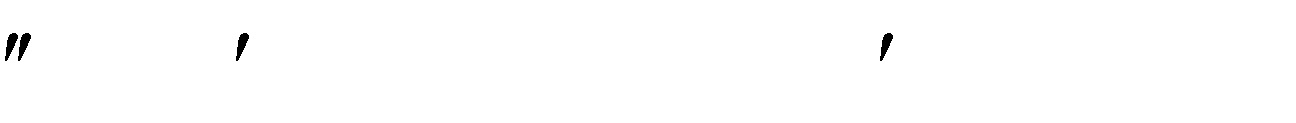
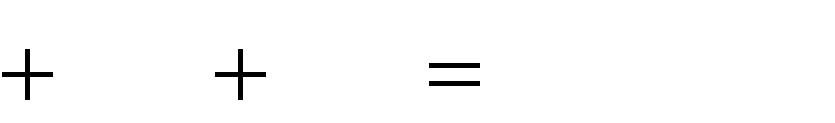
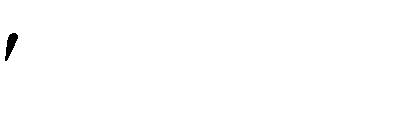
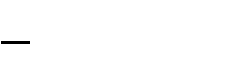
1. **Решите дифференциальные уравнения**

*a*) *y*(1



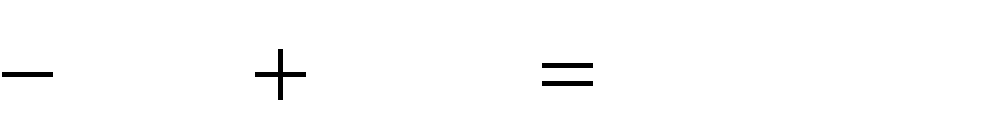
*x*2 )*dy x*(1 *y*2 )*dx* 0

* 1. *b*) *xy e x xy* 0



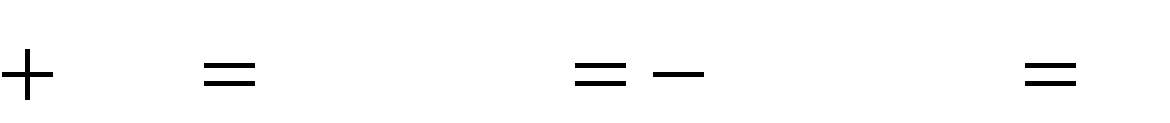
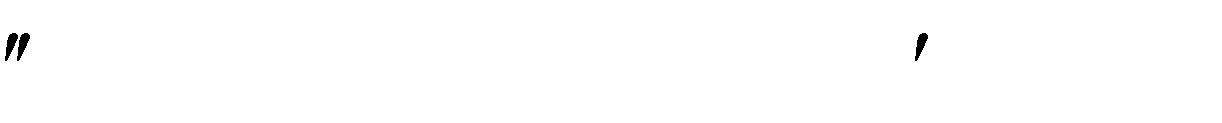
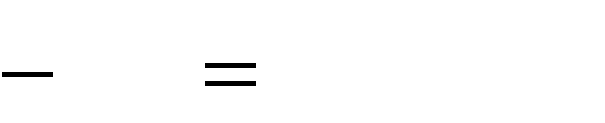
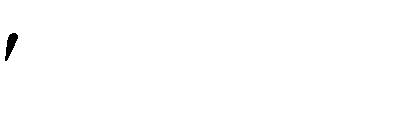
*c*) *y* 2 *y* 0, *y*(0) 0, *y* (0) 9 / 4

* + 1. (3*x*



1)*dy y*2*dx* 0

* 1. *b*) *y*



2 *y*

9 *y*

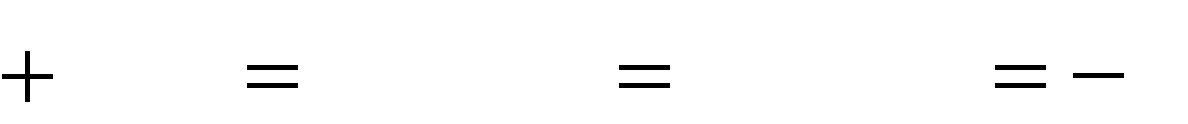
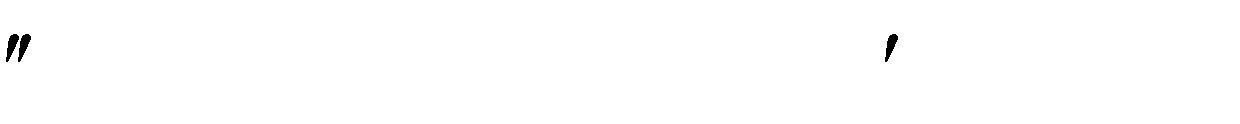
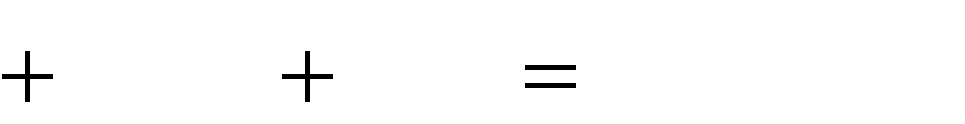
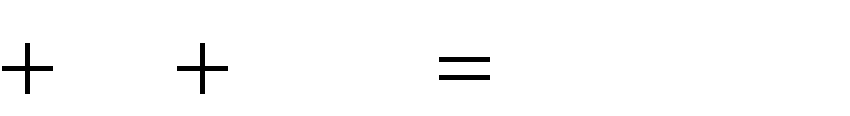
*e*2 *x*

0, *y*(0)

7, *y* (0) 0

*c*) *y*

*a*) 3*ydx* (*x* 1)*dy* 0



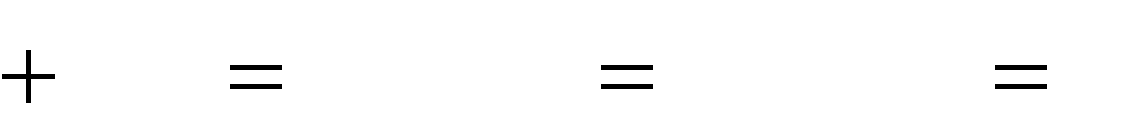
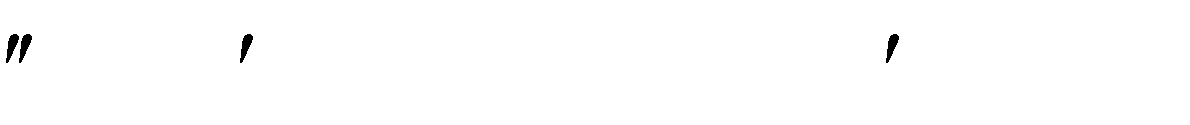
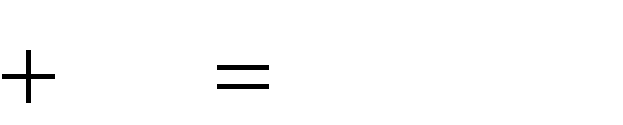
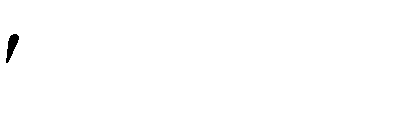
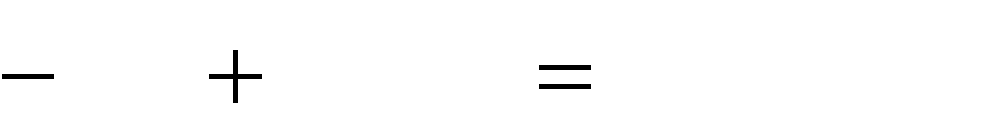
* 1. *b*) (2*x y*)*dx xdy* 0

*c*) *y*

16 *y*

0, *y*(0) 1, *y* (0) 1

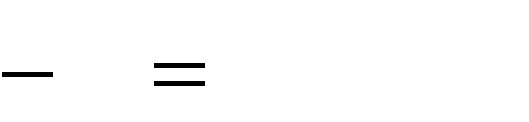
*a*) *yx*2*dy x*(1 *y*2 )*dx* 0



* 1. *b*) *xy xy* 0

*c*) *y* 4 *y* 0, *y*(0) 0, *y* (0) 2

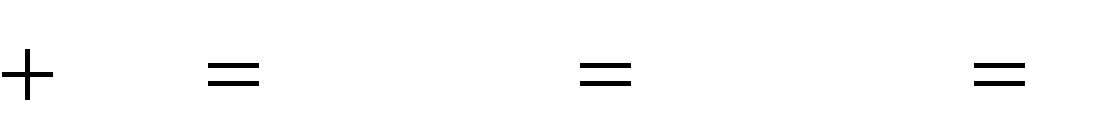
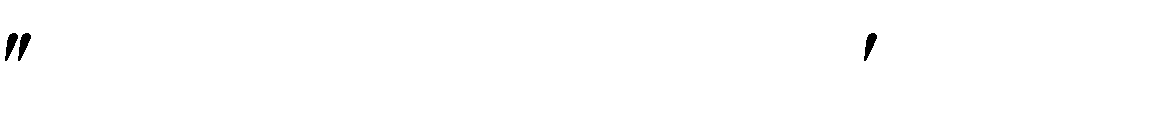
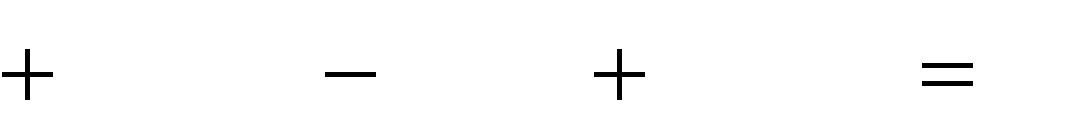
* + 1. *xdy*



*dx*

*y y*2

* 1. *b*) (*xy y*2 )*dx*

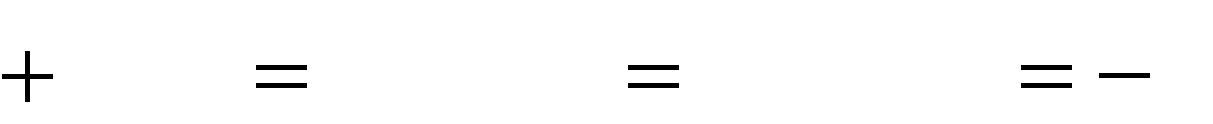
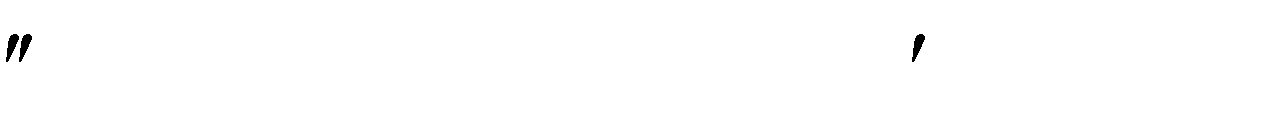
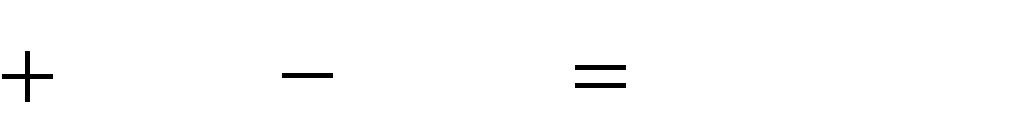
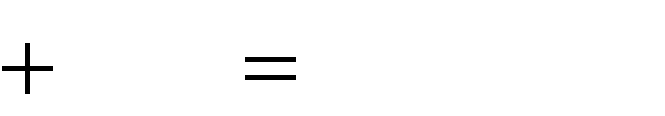


(2*x*2

*xy*)*dy* 0

*c*) *y* 4 *y* 0, *y*(0) 0, *y* (0) 3

* + 1. *ydx xdy y* ln *ydx*



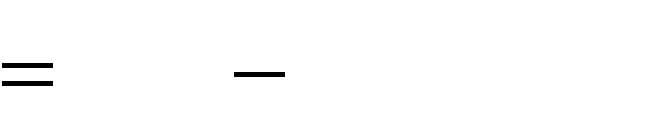
* 1. *b*) (*x y*)*dx* 2*xdy* 0

*c*) *y*

25*y*

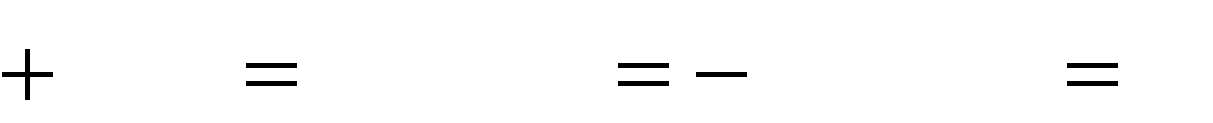
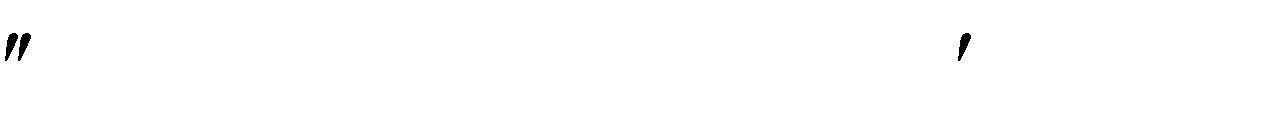
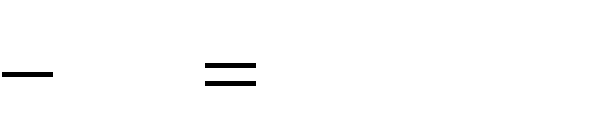
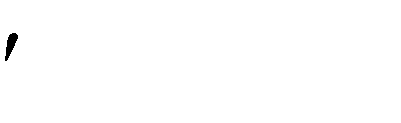
0, *y*(0) 0, *y* (0) 1

*a*) *y dx*



(4*x* 1)*dy*

* 1. *b*) *y*



2 *y*

16 *y*

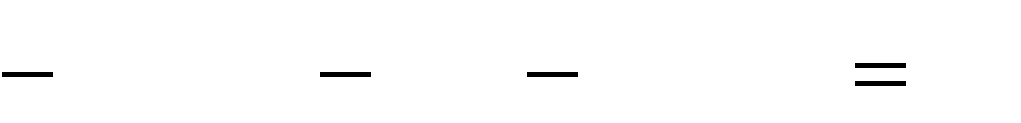
*e*2 *x*

0, *y*(0)

2, *y* (0) 0

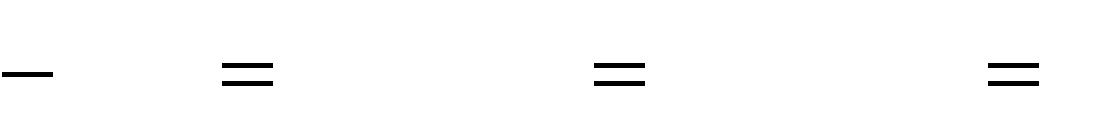
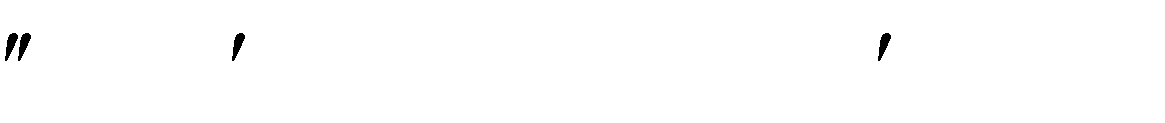
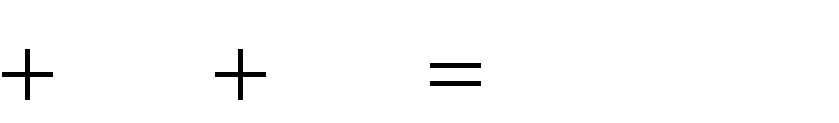
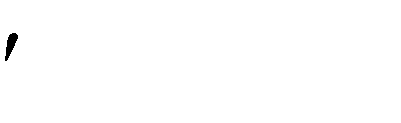
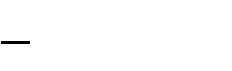
*c*) *y*

*a*) 2 *y*(1



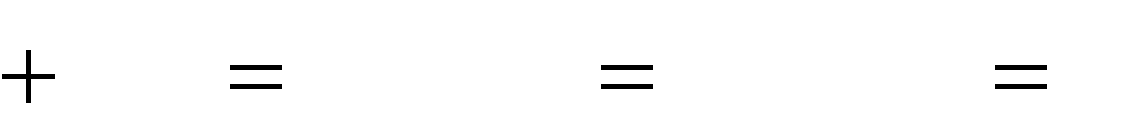
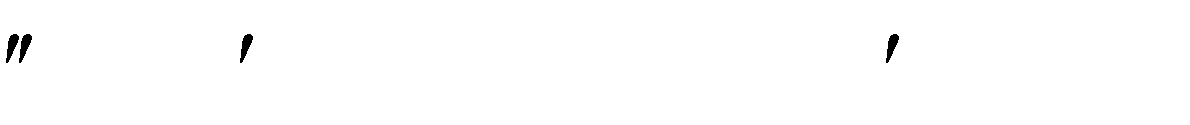
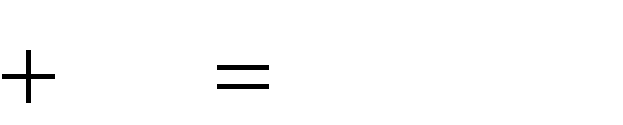
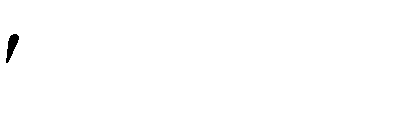
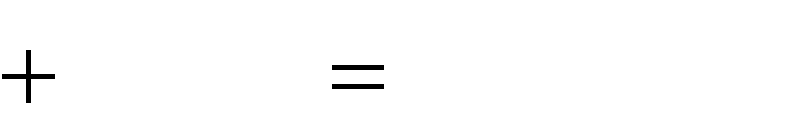
*x*2 )*dy x*(1 *y*2 )*dx* 0

* 1. *b*) *xy e x xy* 0



*c*) *y* 3*y* 0, *y*(0) 0, *y* (0) 1

* + 1. *x*(1

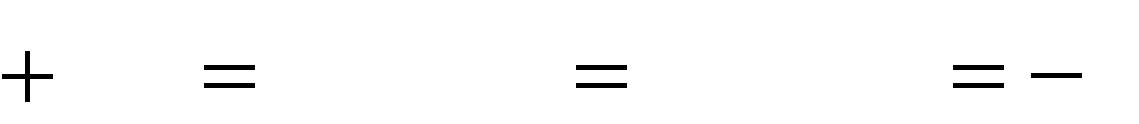
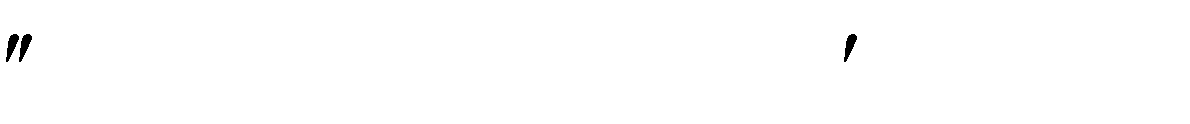
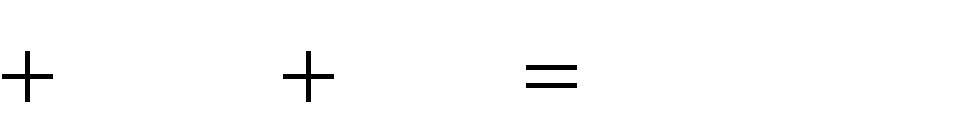
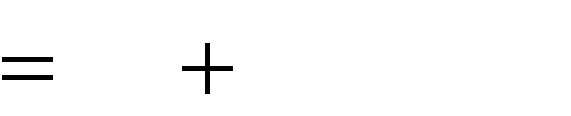


*y*2 )*dx yx*2*dy*

* 1. *b*) *xy xy* 0

*c*) *y* 4 *y* 0, *y*(0) 0, *y* (0) 2

* + 1. *ydx* (*x* 1)*dy*



* 1. *b*) (2*x y*)*dx xdy* 0

*c*) *y* 9 *y* 0, *y*(0) 1, *y* (0) 1

Литература:

1. Высшая математика для экономистов: Учеб. для вузов / Под ред. Н. Ш. Кремера. - 2-е изд., перераб. и доп. - М.: Банки и биржи: ЮНИТИ, 2001. - 471c.
2. Общий курс высшей математики для экономистов : учебник / ред. В. И. Ермаков. - М. : ИНФРА-М, 2010. - 655 с.
3. Сборник задач по высшей математике для экономистов : аналитическая геометрия, линейная алгебра, математический анализ, теория вероятностей, математическая статистика, линейное программирование: учеб. пособие для студентов высших учебных заведений, обучающихся по направлению "Экономика" и экономическим специальностям / [В.И. Ермаков и др. ; под ред. В.И. Ермакова]. - 2-е изд., испр.. - М. : ИНФРА-М, 2009
4. Чучкалова С.В. Математический анализ: учебно-методическое пособие для самостоятельной работы / С.В. Чучкалова. - Киров: ПРИП ФГБОУ ВПО «ВятГУ», 2013.