Chapter: CH13. Problem: 14E (3 users) show all steps

CH13.1 13E

Step 1 of 5

$$g(x,y)=\int_x^y \frac{1}{t}dt$$

Provide feedback (0)

Step 2 of 5

(A)

$$\begin{aligned} g(4,1) &= \int_4^1 \frac{1}{t}dt \\ &= \left[ln|t|\right]_4^1 \\ &= ln1 - ln4 \\ &= 0 - ln4 \quad = -ln4 \end{aligned}$$

Provide feedback (0)

Step 3 of 5

(B)

$$\begin{aligned} g(6,3) &= \int_6^3 \frac{1}{t}dt \\ &= \left[ln|t|\right]_6^3 \\ &= ln3 - ln6 \\ &= ln3 - ln2 - ln3 = -ln2 \end{aligned}$$

Provide feedback (0)

Step 4 of 5

(C)

$$\begin{aligned} g(2,5) &= \int_2^5 \frac{1}{t}dt \\ &= \left[ln|t|\right]_2^5 \\ &= ln5 - ln2 \\ &= ln(5/2) \end{aligned}$$

Provide feedback (0)

Step 5 of 5

(D)

$$\begin{aligned} g\left(\frac{1}{2},7\right) &= \int_{\frac{1}{2}}^7 \frac{1}{t}dt \\ &= \left[ln|t|\right]_{\frac{1}{2}}^7 \\ &= ln7 = ln(1/2) \\ &= ln7 - ln(1) + ln(2) = ln7 + ln2 = ln(14) \end{aligned}$$

Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 46E

Chapter: CH13. Problem: 46E (2 users) show all steps

CH13.1
45E

Step 1 of 1

$f(x,y)=e^{1-x^2+y^2}$

Let $f(x,y)=c\,(\text{constant})$

Then $c=e^{1-x^2+y^2}$

Or $\ln c=1-x^2+y^2$

Or, $k=1-x^2+y^2$ $\quad (k=\ln c)$

Or $x^2-y^2=1-k$

Or $x^2-y^2=r$ $\quad (r=1-k)$

Or, $\dfrac{x^2}{r}-\dfrac{y^2}{r}=1$

Which is a hyper bola

Thus for each value of c, the level curve in xy-plane is a hyper bola whose asymptotes are lines $y=\pm x$. Hence the contour maps of the given surface are given by figure (d)

Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 51E

Chapter: CH13. Problem: 51E (5 users) show all steps

CH13.1 50E

C

Step 1 of 2

$$z=\sqrt{25-x^2-y^2}$$

Let $z=c$

Then $c=\sqrt{25-x^2-y^2}$

Or, $c^2=25-x^2-y^2$

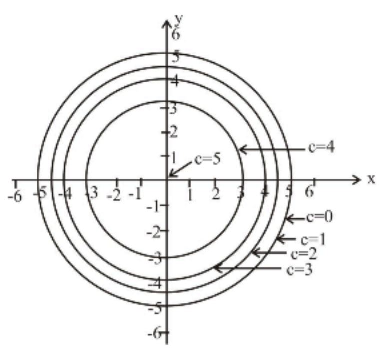
Or $x^2+y^2=25-c^2$ which is a circle.

Thus for each value of c, the level curve in xy-plane is a circle.

The level curve for $c=0,1,2,3,4,5,$ are given below

Provide feedback (0)

Step 2 of 2



Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 17E

CH13.1 16E

Step 1 of 1

$$f(x,y)=\sqrt{4-x^2-y^2}$$

$$f(x,y) \textit{ is defind for } 4-x^2-y^2 \geq 0$$

$i.e.$ *for* $4 \geq x^2+y^2$

Thus the domain of f(x, y) is :

$$D=\{(x,y): x^2+y^2 \leq 4\}$$

i. e. the set of all points lying on or inside the circle $x^2+y^2=4$

The range of f is all values z = f(x, y) such that $0 \leq z \leq 2$

Functions 4th Edition Chapter 13.1 Problem 22E

Chapter: CH13. Problem: 22E (4 users) show all steps

CH13.1 21E

Step 1 of 1

$$f(x,y) = ln(xy-6)$$

$f(x,y)$ is defined for $xy-6>0$

$i.e.\ for\ xy>6$

Thus the domain of $f(x,y)$ is

$$D = \{(x,y) : xy > 6\}$$

The range of f is the set of real R

Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 25E

Chapter: CH13. Problem: 25E (6 users) show all steps

CH13.1 24E

Step 1 of 1

$f(x,y) = e^{x/y}$

The function $f(x,y)$ is not defined for y = 0

Thus the domain of f is

$D = \{(x,y) : y \neq 0\}$

Since $e^t > 0$ for all t, thus the range of $z = f(x,y)$ is all the reals greater than 0

$i.e. \quad z > 0$

Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 45E

Chapter: CH13. Problem: 45E (6 users) show all steps

CH13.1 44E

Step 1 of 1

$$f(x,y) = e^{1-x^2-y^2}$$

Let $f(x,y) = c\,(Constant)$

Then $c = e^{1-x^2-y^2}$

Or, $\ln c = 1 - x^2 - y^2$

Or, $k = 1 - x^2 - y^2 \qquad (k = \ln c)$

Or, $x^2 + y^2 = 1 - k$

Or, $x^2 + y^2 = r \qquad (r = 1 - k)$

Which represents a circle

Thus for each value of c, the level curve in the xy-plane is a circle. Hence the contour maps of the given surface are given by figure (c)

Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 48E

Chapter: CH13 Problem: 48E (2 users) show all steps

CH13.1 47E

Step 1 of 1

$$f(x,y)=\cos\left(\frac{x^2+2y^2}{4}\right)$$

Let $f(x,y)=c\,(constant)$ $\quad$ *Where* $-1\le c\le 1$

Then $c=\cos\left(\frac{x^2+2y^2}{4}\right)$

Or, $\cos^{-1}c=\frac{x^2+2y^2}{4}$

Or $k=\frac{x^2+2y^2}{4}$ $\quad$ $(k=\cos^{-1}c)$

Or $k=\frac{x^2}{4}+\frac{y^2}{2}$

Or, $\frac{x^2}{4k}+\frac{y^2}{2k}=1$

Which represents an ellipse

Thus for each value of c, the level curve in xy-plane is an ellipse. Hence the contour maps of the given surface are given by figure (A)

Provide feedback (0)

Functions 4th Edition Chapter 13.1 Problem 47E

Chapter: CH13. Problem: 47E (2 users) show all steps

CH13.1 46E

Step 1 of 1

$$f(x,y) = ln|y - x^2|$$

Let $f(x,y) = c\,(constant)$

Then $c = ln|y - x^2|$

Or $e^c = y - x^2$

Or $k = y - x^2$ $\quad (k = e^c)$

Or $x^2 = y - k$

Which is an upward parabola with vertex at (o,k)

Thus for each value of e, the level curve in xy-plane is a parabola. Hence the contour map of the given surface are given by figure (B)

Provide feedback (0)