



[← MA2009, section GRUPO4, Fall 2019](#)
 INSTRUCTOR

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Tecnologico de Monterrey, Mexico

Tarea 3. Funciones de varias variables (Homework)

Current Score							Due Date	Past Due
QUESTION	1	2	3	4	5	6	<div>SEP. 7 11:59 P. M.</div> <div><div><div><div></div><div>Request Extension</div></div></div></div>	
POINTS	7.69/7.69 ✓	7.69/7.69 ✓	7.69/7.69 ✓	7.69/7.69 ✓	7.69/7.69 ✓	7.69/7.69 ✓		
<div><div>TOTAL</div><div><div>100/100</div><div>100.0%</div></div></div>								

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

The due date for this assignment has passed.

Your work can be viewed below, but no changes can be made.


Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may not grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.


[Request Extension](#)

[View Key](#)

Let $g(x, y) = \cos(x + 3y)$.

(a) Evaluate $g(6, -2)$.

$g(6, -2) =$ 

(b) Find the domain of g .

☐ $-3 \leq x \leq 3, -1 \leq y \leq 1$

☐ $\frac{\pi}{2} \leq x + 3y \leq \frac{\pi}{2}$

☐ $-1 \leq x + 3y \leq 1$

☒ \mathbb{R}^2

☐ $-1 \leq x \leq 1, \frac{1}{3} \leq y \leq \frac{1}{3}$



(c) Find the range of g . (Enter your answer using interval notation.)

$[-1, 1]$



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2.

7.69/7.69 points Previous Answers

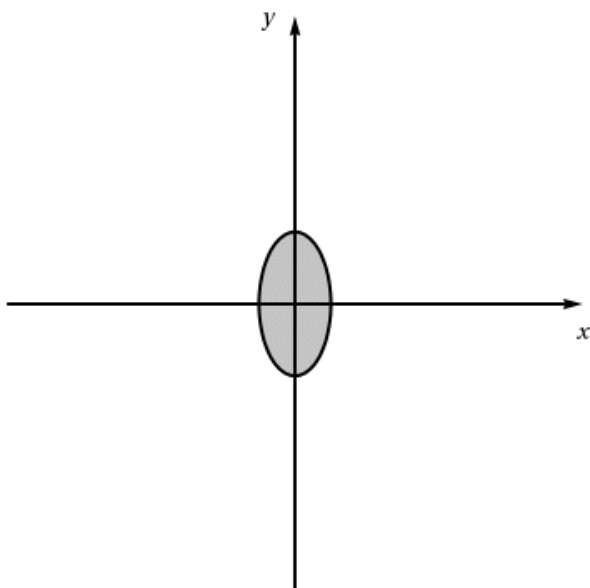
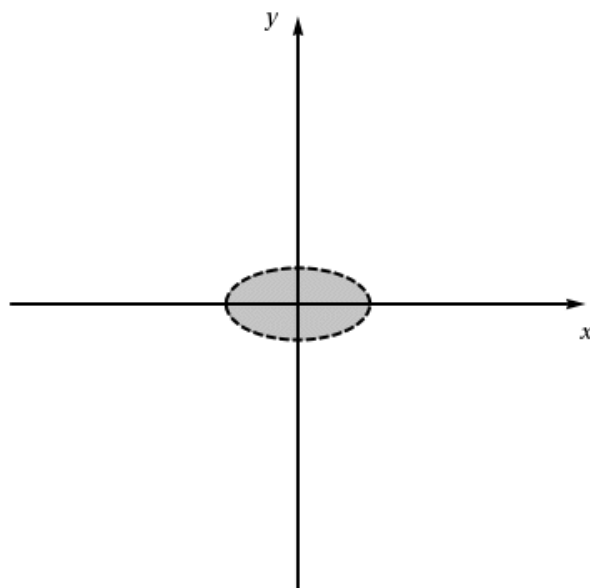
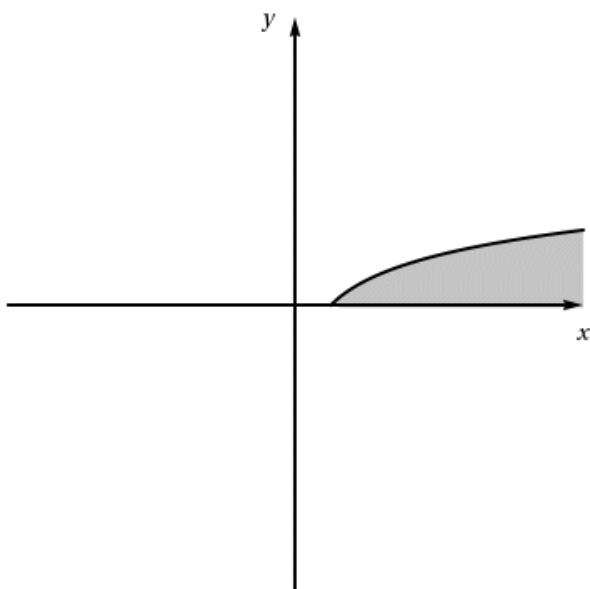
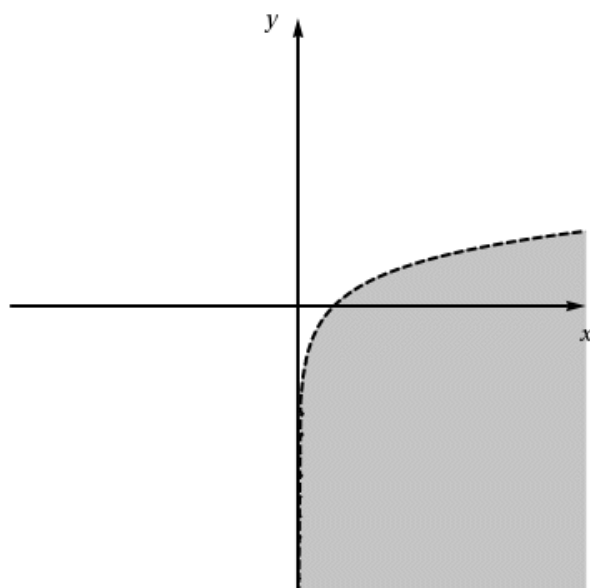
SCalc8 14.1.015.

 My Notes

Ask Your Teacher

Find and sketch the domain of the function.

$$f(x, y) = \ln(4 - x^2 - 4y^2)$$

☐☒☐☐

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3.

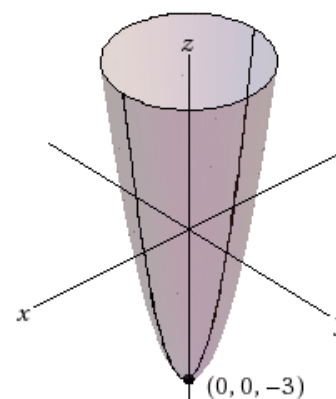
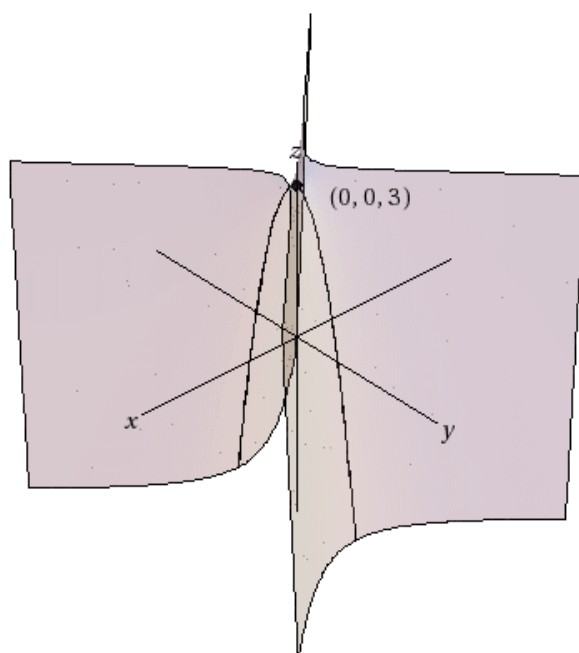
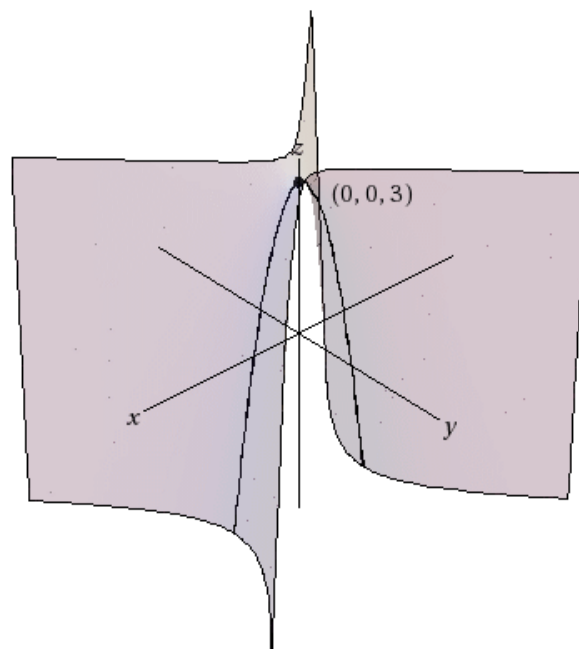
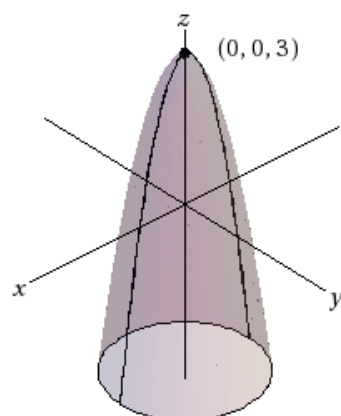
7.69/7.69 points Previous Answers

SCalc8 14.1.028.

 My Notes[Ask Your Teacher](#)

Sketch the graph of the function.

$$f(x, y) = 3 - x^2 - y^2$$



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4.

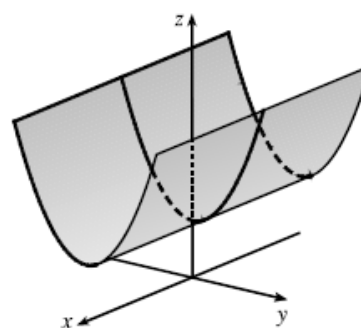
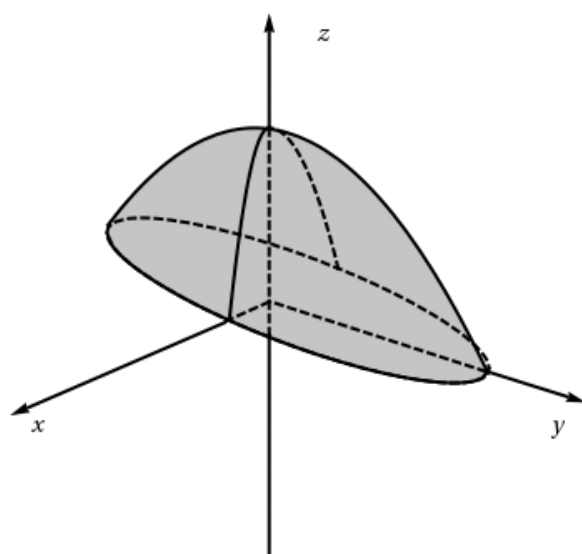
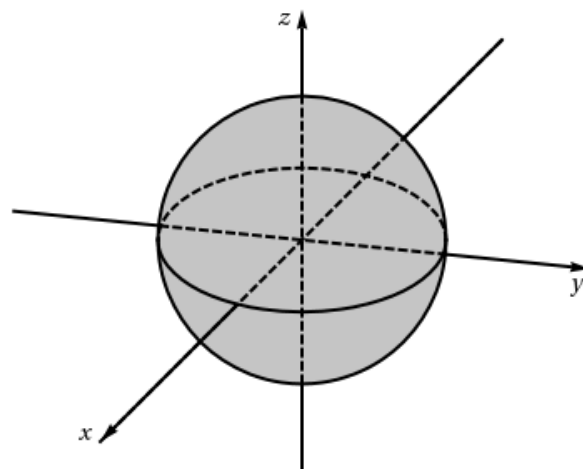
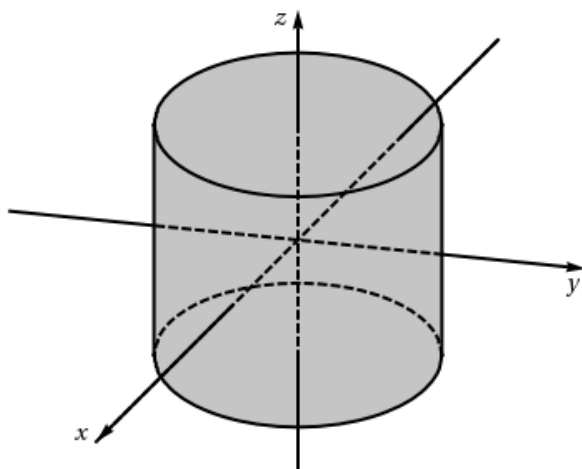
7.69/7.69 points Previous Answers

SCalc8 14.1.031.

 My Notes[Ask Your Teacher](#)

Sketch the graph of the function.

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

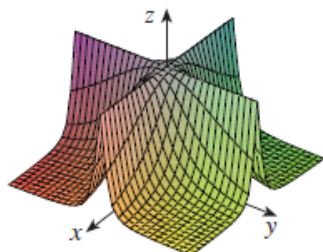


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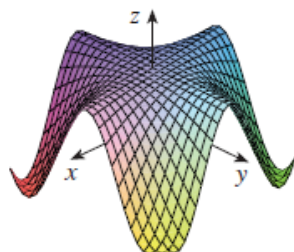
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Match the function with its graph (labeled I-VI).

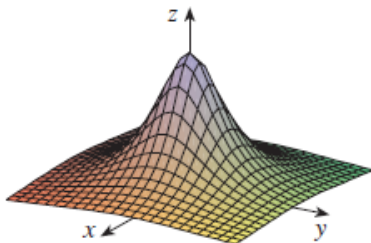
I



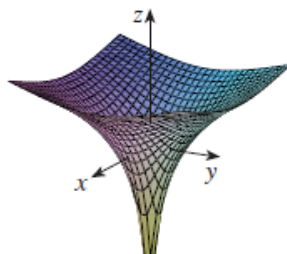
II



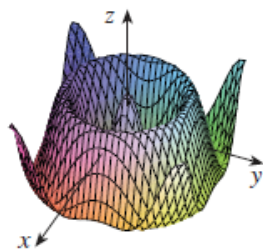
III



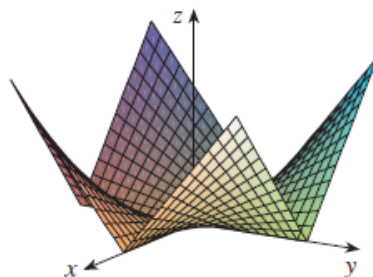
IV



V



VI



(a) $f(x, y) = \frac{1}{1 + x^2 + y^2}$

III ✓

(b) $f(x, y) = \frac{1}{1 + x^2 y^2}$

I ✓

(c) $f(x, y) = \ln(x^2 + y^2)$

IV ✓

(d) $f(x, y) = \cos(\sqrt{x^2 + y^2})$

V ✓

(e) $f(x, y) = |xy|$

VI ✓

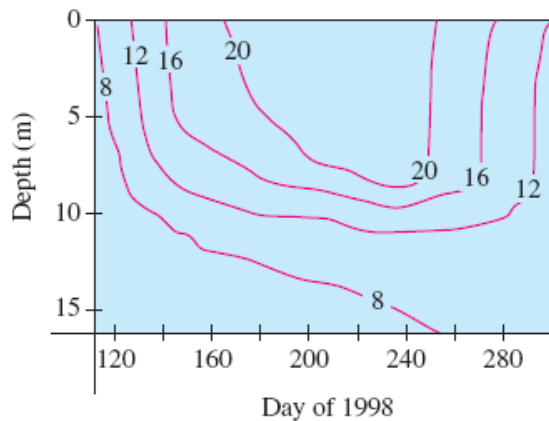
(f) $f(x, y) = \cos(xy)$

II ✓

Level curves (isothermals) are shown for the typical water temperature (in $^{\circ}\text{C}$) in Long Lake (Minnesota) in 1998 as a function of depth and time of year. Estimate the temperature in the lake on **June 19** (day 180) at a depth of 5 m and on **September 17** (day 260) at a depth of 10 m.

✓ $^{\circ}\text{C}$ (day 180 and depth 5 m)

✓ $^{\circ}\text{C}$ (day 260 and depth 10 m)



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7.

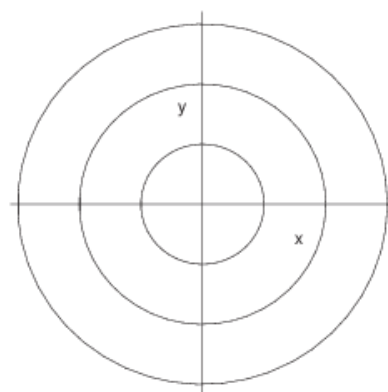
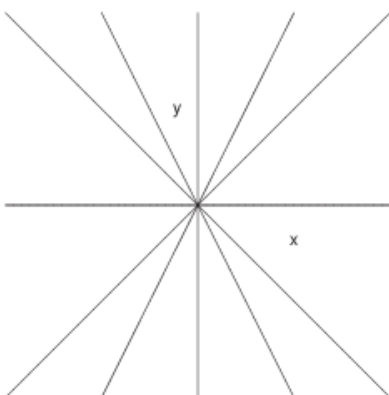
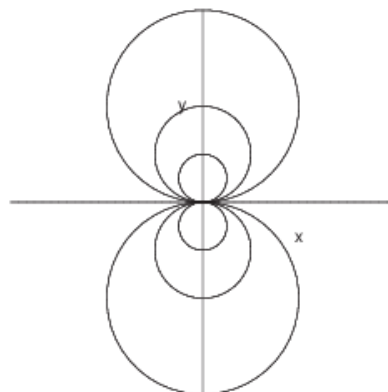
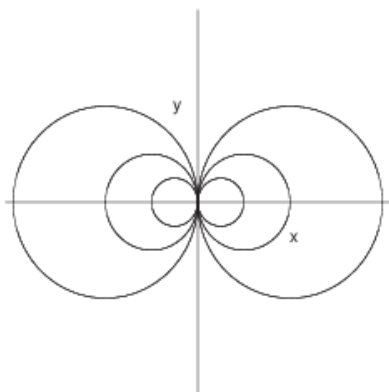
7.69/7.69 points Previous Answers

SCalc8 14.1.052.

 My Notes[Ask Your Teacher](#)

Draw a contour map of the function showing several level curves.

$$f(x, y) = y/(x^2 + y^2) - 2$$



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8.

7.69/7.69 points Previous Answers

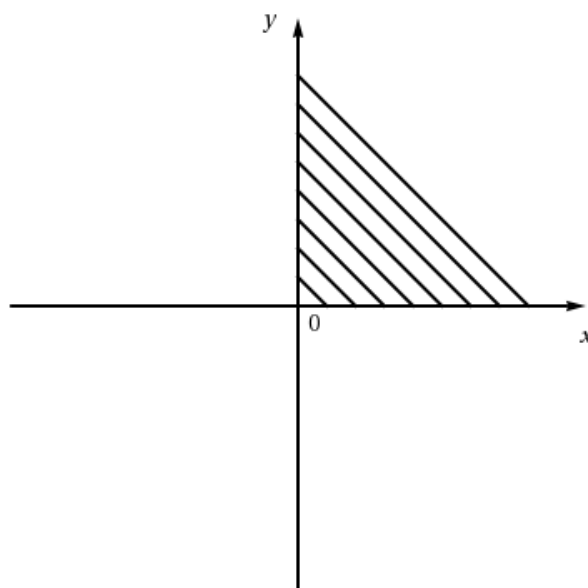
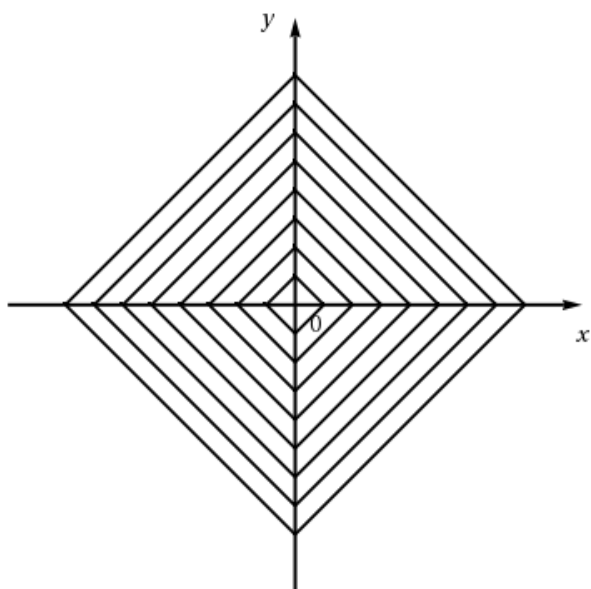
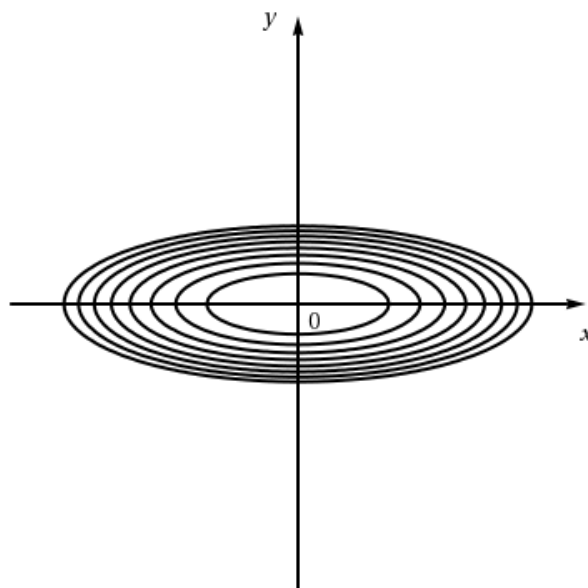
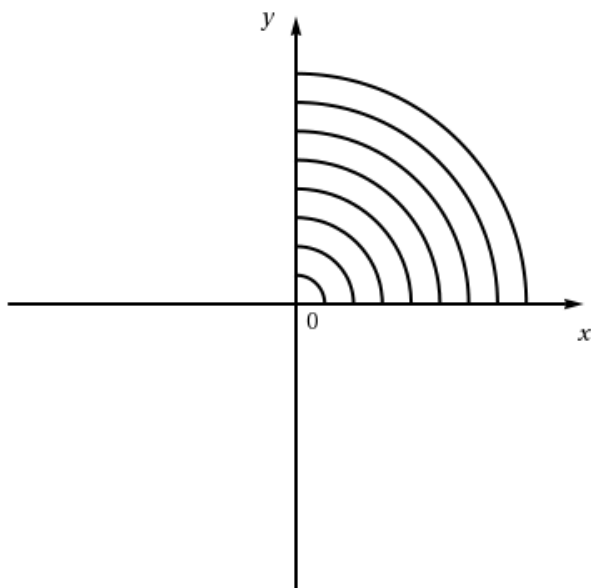
SCalc8 14.1.053.

 My Notes

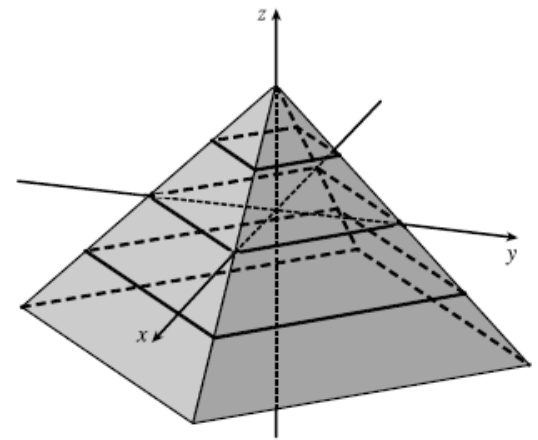
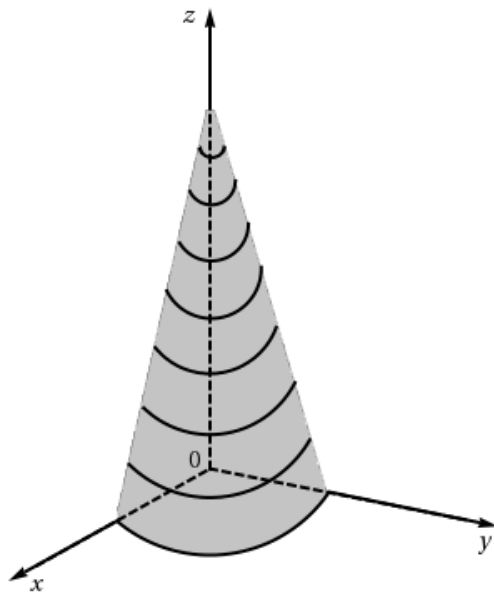
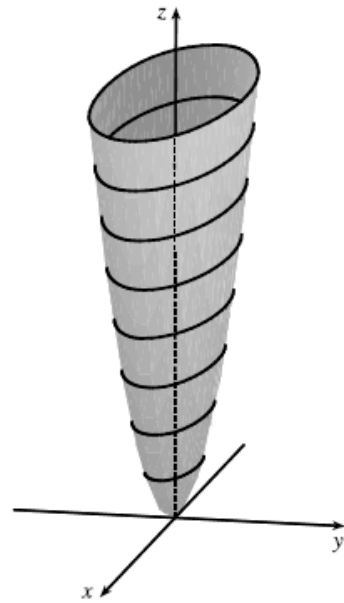
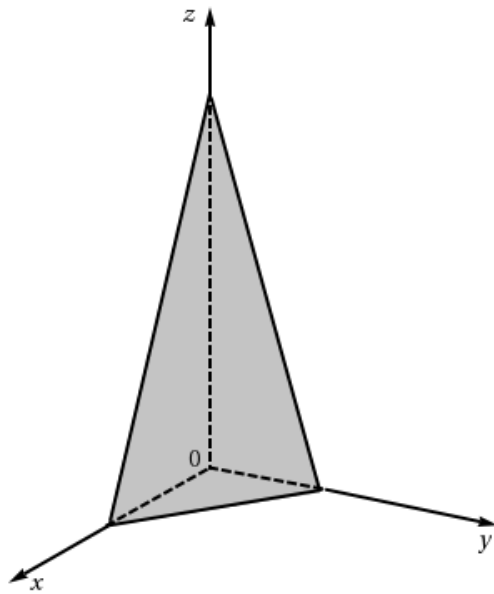
Ask Your Teacher

Sketch a contour map of the function.

$$f(x, y) = x^2 + 6y^2$$



Sketch a graph of the function and compare it to the contour map.



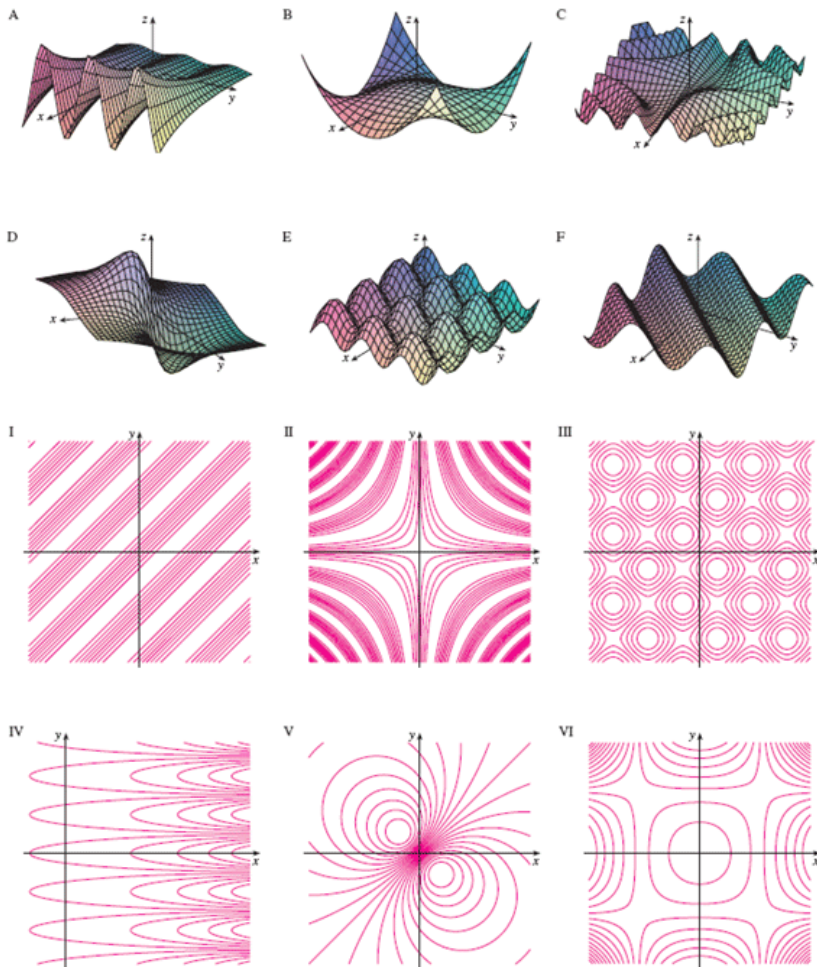
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Consider the function below.

$$z = \sin(xy)$$



(a) Match the function with its graph (labeled A-F).

- ☐ A
☐ B
☒ C
☐ D
☐ E
☐ F



(b) Match the function with its contour map (labeled I-VI).

- ☐ I
- ☒ II
- ☐ III
- ☐ IV
- ☐ V
- ☐ VI



Give reasons for your choices.

This function is in both x and y , and the function is when x is interchanged with y , so its graph is about the plane $y =$

x

. In addition, the function is along the x - and y -axes. These conditions are satisfied only by and .

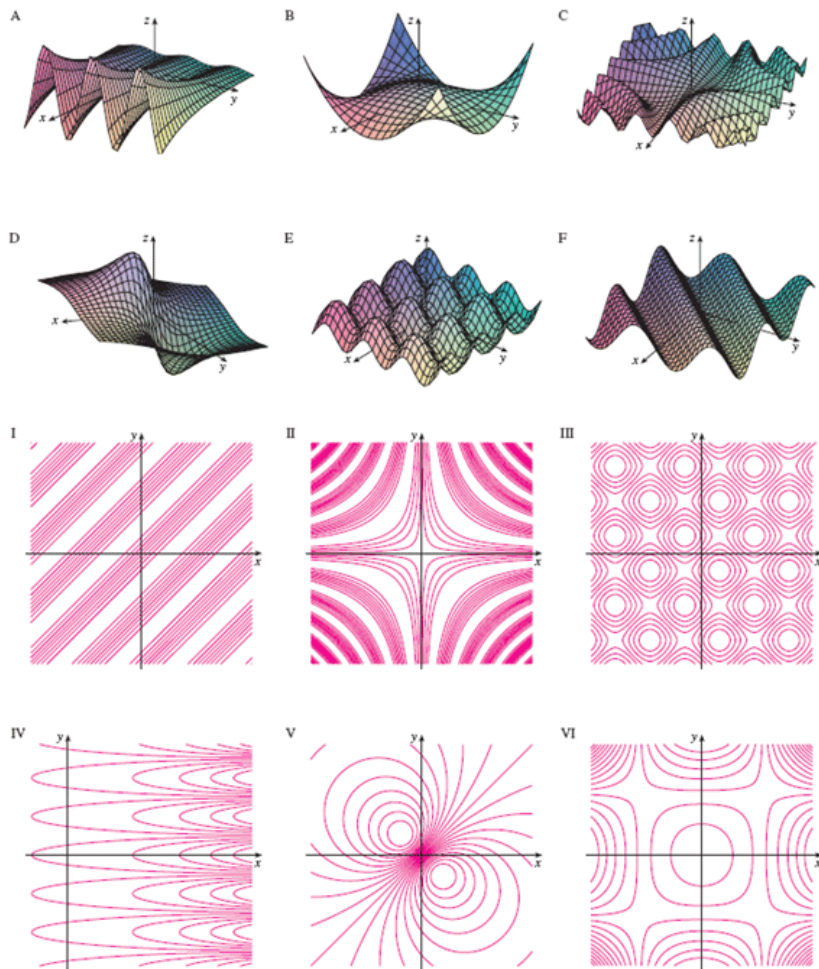
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Consider the function below.

$$z = e^x \cos(y)$$



(a) Match the function with its graph (labeled A-F).

- ☒ A
☐ B
☐ C
☐ D
☐ E
☐ F
- 

(b) Match the function with its contour map (labeled I-VI).

- ☐ I
- ☐ II
- ☐ III
- ☒ IV
- ☐ V
- ☐ VI



Give reasons for your choices.

This function is periodic ✓ in y but not x , a condition satisfied only by A ✓ and IV ✓. Also, note that traces in $x = k$ are cosine curves ✓ with amplitude ✓ that increase(s) ✓ as x increases.

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11. **7.69/7.69 points** [Previous Answers](#)

S Calc8 14.1.070.

[My Notes](#)

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Describe the level surfaces of the function.

$$f(x, y, z) = x^2 - y^2 - z^2$$

- ☐ The level surfaces are a family of hyperbolic cylinders.
- ☐ The level surfaces are a family of ellipsoids.
- ☐ The level surfaces are a family of parallel planes.
- ☒ The level surfaces are a family of hyperboloids.



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12. **7.69/7.69 points** [Previous Answers](#)

S Calc8 14.1.068.

[My Notes](#)

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Describe the level surfaces of the function.

$$f(x, y, z) = x^2 + 3y^2 + 2z^2$$

- ☐ The level surfaces are a family of parallel planes.
- ☒ The level surfaces are a family of ellipsoids.
- ☐ The level surfaces are a family of hyperboloids.
- ☐ The level surfaces are a family of hyperbolic cylinders.

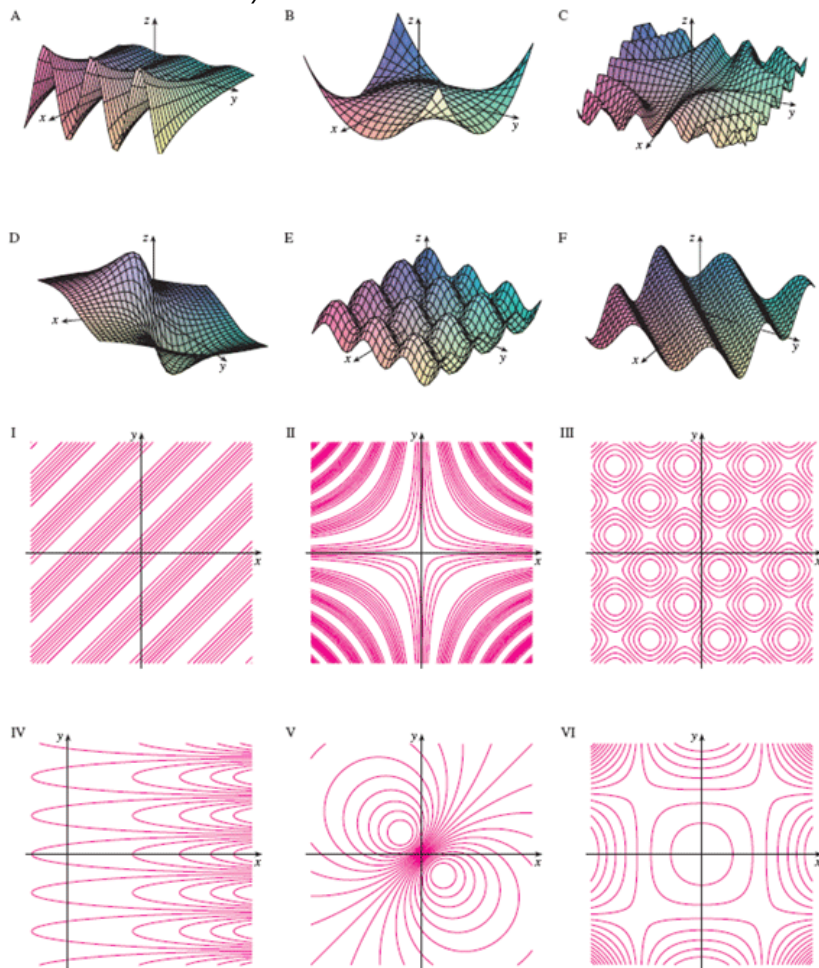


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Consider the function below.

$$z = \frac{x - y}{5 + x^2 + y^2}$$




(a) Match the function with its graph (labeled A-F).




- ☐ A
☐ B
☐ C
☒ D
☐ E
☐ F



(b) Match the function with its contour map (labeled I-VI).

- ☐ I
 - ☐ II
 - ☐ III
 - ☐ IV
 - ☒ V
 - ☐ VI
- 

Give reasons for your choices.

This function is not periodic, ruling out the graphs in A, C, E, F . Also, the values of z approach 0 as we use points farther from the origin. The only graph that shows this behavior is D , which corresponds to V .

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