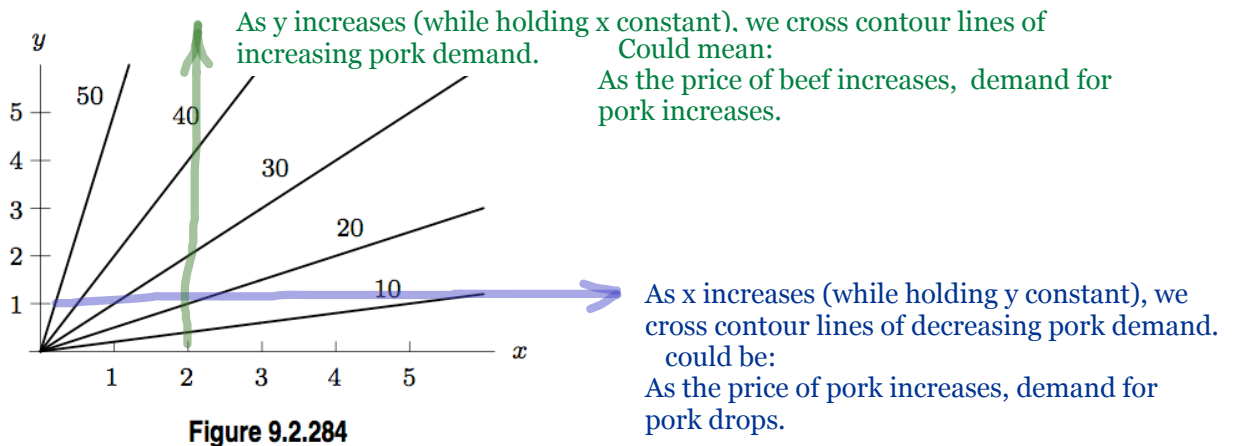18. The following table shows revenue, R, in hundreds of dollars, at a movie theater as a function of number of tickets sold, t, and the number of food items sold, f. Thus $R = g(t,f)$.

<center>t</center>

	100	200	300	400	500
200	11	19	27	35	43
400	14	22	30	38	46
600	17	25	33	41	49
800	20	28	36	44	52
1000	23	31	39	47	55

(f labels the left column)

In practical meaning, using everyday words, what is the meaning of $g(200,600)$?
   This is the revenue when 200 tickets and 600 food items are sold

19. The following figure is a contour diagram for the demand for pork as a function of the price of pork and the price of beef? Which axis corresponds to pork and which corresponds to beef? Explain your answer. The x axis is the price of pork and the y axis is the price of beef.

As y increases (while holding x constant), we cross contour lines of increasing pork demand.   Could mean:
As the price of beef increases, demand for pork increases.

As x increases (while holding y constant), we cross contour lines of decreasing pork demand.
   could be:
As the price of pork increases, demand for pork drops.

Figure 9.2.284

20. (Multiple Choice) For a certain function $z = f(x, y)$, we know that $f(0,0) = 50$ and that z goes up by 3 units for every unit increase in x and z goes down by 2 units for every unit increase in y.
   What is f (2, 5)? $z = 50 + 3x - 2y$. So the answer is 50+3*2–2*5=46
   (a) 51
   (b) 46
   (c) 1
   (d) 55
   (e) –4
   (f) 16

21. You build a campfire while up in the mountains. It is 45°F when you start the fire. Let $H(x,t)$ be the temperature x feet from the fire t minutes after you start it. The following figure is the contour diagram for H.
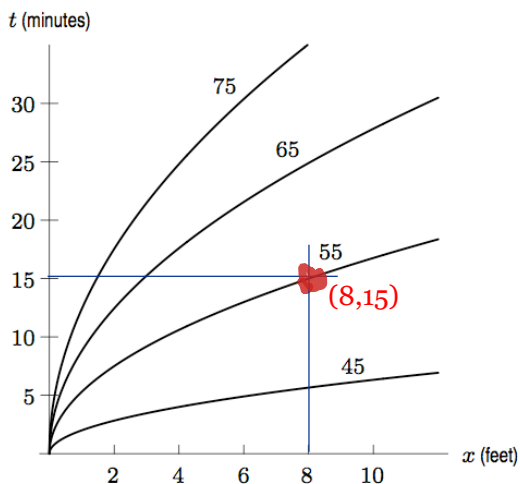

Figure 9.2.291

(a) How warm is it 8 feet from the fire after 15 minutes?
About 55 degrees

(b) Is H an increasing or decreasing function of x? of t?
decreasing function of x, increasing function of t.

22. Sketch a contour diagram of $f(x,y) = 2x - y + 1$. Include at least four labeled contours.

Should get a family of straight lines with slope 2. The contour for $k = 1$ should go through the origin. The values of k should decrease vertically.
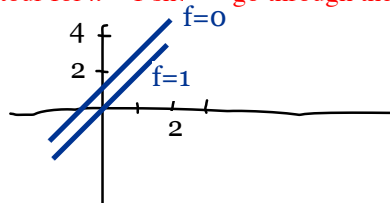
For the k=1 contour, set f=k=1 and solve for y:
　1=2x-y+1, leads to y=2x
For the k=0 contour, set f=0 and solve for y:
　0=2x-y+1, leads to y=2x+1

23. (Multiple Choice) The following table shows values of $f(x, y)$. Does f appear to be an increasing or decreasing function of x?
    Of y?

		y		
		0	5	10	15
	0	75	72	68	60
x	20	80	77	73	68
	40	86	82	75	70
	60	93	88	82	75

Increasing y, while holding x constant at x=20.

(a) Increasing function of x; Increasing function of y
(b) Increasing function of x; Decreasing function of y
(c) Decreasing function of x; Increasing function of y
(d) Decreasing function of x; Decreasing function of y

Means: if we hold x constant, and only allow y to change, then as y increases, f(x,y) decreases.

5.

24. Which of the graphs (a)-(f) shows a cross section of $f(x, y) = 50 - x^2 + 5y$ with y held fixed? Answer is b and f.