

Sections 9.1 and 9.2

Math 211, Exam 1 Review

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  $R = g(t, f)$ .

		$t$				
		100	200	300	400	500
$f$	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

In practical meaning, using everyday words, what is the meaning of  $g(200, 600)$ ?

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.

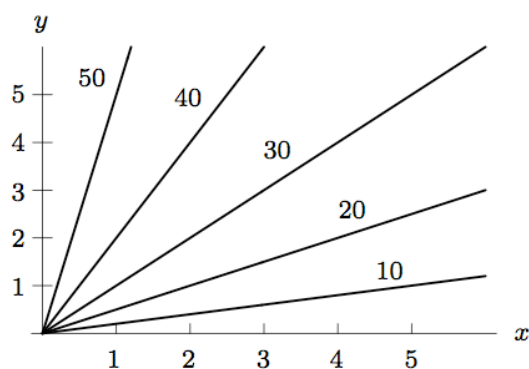


Figure 9.2.284

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  $f(2, 5)$ ?
- (a) 51
  - (b) 46
  - (c) 1
  - (d) 55
  - (e) -4
  - (f) 16

21. You build a campfire while up in the mountains. It is  $45^\circ\text{F}$  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  $H$ .

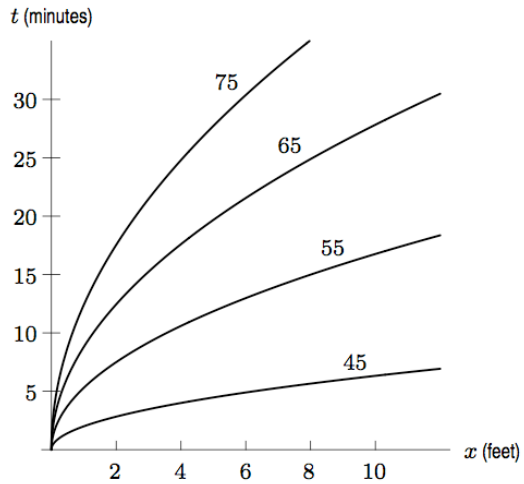


Figure 9.2.291

- (a) How warm is it 8 feet from the fire after 15 minutes?
- (b) Is  $H$  an increasing or decreasing function of  $x$ ? of  $t$ ?
22. Sketch a contour diagram of  $f(x, y) = 2x - y + 1$ . Include at least four labeled contours.

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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
$x$	0	75	72	68	60
	20	80	77	73	68
	40	86	82	75	70
	60	93	88	82	75

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

