Homework #1

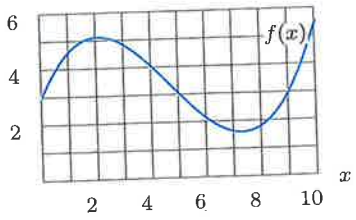
Problems for Section 1.1

3. Let $W = f(t)$ represent wheat production in Argentina,[4] in millions of metric tons, where t is years since 1990. Interpret the statement $f(12) = 9$ in terms of wheat production.

For the functions in Problems 7–11, find $f(5)$

7. $f(x) = 2x + 3$

9.



15. The number of sales per month, S, is a function of the amount, a (in dollars), spent on advertising that month, so $S = f(a)$.

(a) Interpret the statement $f(1000) = 3500$.
(b) Which of the graphs in Figure 1.8 is more likely to represent this function?
(c) What does the vertical intercept of the graph of this function represent, in terms of sales and advertising?

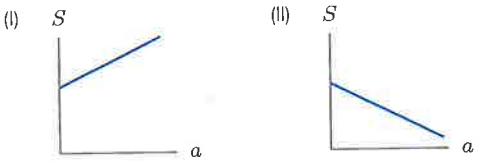


Figure 1.8

12. A cell phone company charges a monthly fee of \$25 plus \$0.05 per minute. Find a formula for the monthly charge, C, in dollars, as a function of the number of minutes, m, the phone is used during the month.

15. Annual revenue R from McDonald's restaurants worldwide can be estimated by $R = 19.1 + 1.8t$, where R is in billion dollars and t is in years since January 1, 2005.[13]

(a) What is the slope of this function? Include units. Interpret the slope in terms of McDonald's revenue.
(b) What is the vertical intercept of this function? Include units. Interpret the vertical intercept in terms of McDonald's revenue.
(c) What annual revenue does the function predict for 2010?
(d) When is annual revenue predicted to hit 30 billion dollars?

Problems for Section 1.2

For Problems 1–4, determine the slope and the y-intercept of the line whose equation is given.

1. $7y + 12x - 2 = 0$

3. $12x = 6y + 4$

For Problems 5–8, find an equation for the line that passes through the given points.

5. $(0, 2)$ and $(2, 3)$

7. $(-2, 1)$ and $(2, 3)$

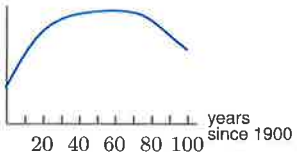
ANSWERS TO ODD-NUMBERED PROBLEMS

Section 1.1

1 (a) (IV)
(b) (II)
(c) (III)

3 Argentina produced 9 million metric tons of wheat in 2002

5 population



7 $f(5) = 13$

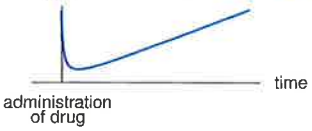
9 $f(5) = 3$

11 $f(5) = 4.1$

13 (b) CFC consumption in 1987
(c) Year CFC consumption is zero

15 see below

17



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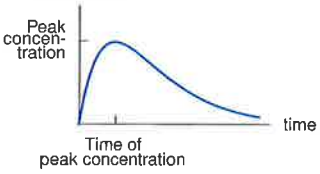

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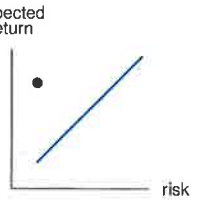
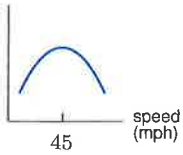


23 (a) (III)
(b) Potato's temperature before put in oven

25



Section 1.2

1 Slope: $-12/7$
Vertical intercept: $2/7$

3 Slope: 2
Vertical intercept: $-2/3$

5 $y = (1/2)x + 2$

7 $y = (1/2)x + 2$

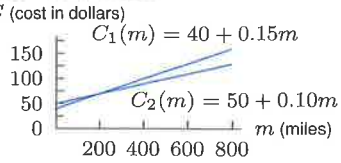
9 (a) l_1
(b) l_3
(c) l_2
(d) l_4

11 (a) $P = 30{,}700 + 850t$
(b) 39,200 people
(c) In 2016

12. $C = 25 + 0.05m$ ~~dollars~~

13 (a) $C_1 = 40 + 0.15m$
$C_2 = 50 + 0.10m$

(b) C (cost in dollars)



(c) For distances less than 200 miles, C_1 is cheaper.
For distances more than 200 miles, C_2 is cheaper.

15 (a) 1.8 billion dollars/year
(b) 19.1 billion dollars
(c) 28.1 billion dollars
(d) 2011

17 (a) Linear
(b) Linear
(c) Not linear

19 (a) $q = -(1/3)p + 8$
(b) $p = -3q + 24$

21 (a) $P = 11.3 + 0.4t$
(b) 13.7%
(c) 1.4%

23 (b) $P = 100 - 0.5d$
(c) -0.5%/ft
(d) 100%; 200 ft

25 (a) $C = 3.68 + 0.12w$
(b) 0.12 \$/gal
(c) \$3.68

27 (a) $\Delta w/\Delta h$ constant
(b) $w = 5h - 174$; 5 lbs/in
(c) $h = 0.2w + 34.8$; 0.2 in/lb

29 (c)

31 (a) 60, 40 years
(b) (ii)
(c) 6.375 beats/minute more under new formula

33 No

Section 1.3

1 Concave down

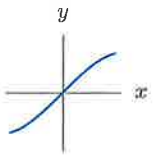
3 Concave up

5 Increases by 12.5%

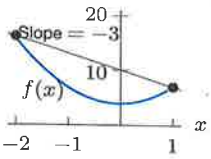
7 Decreases by 6%

9 Decreasing
Concave up

11



13 -3



15 (a) 90 million bicycles
(b) 1.8 million bicycles per year

17 (a) 115,000 people/year
(b) 0.07, 0.08, 0.41, 0.06
(c) 115,000 people/year

19 (a) \$18,280 million
(b) \$3656 million per year

21 1 meter/sec

23 $72/7 = 10.286$ cm/sec

25 (a) Negative
(b) Positive
(c) Negative
(d) Negative
(e) Positive

27 1490 thousand people/year
912.9 thousand people/year
1879 thousand people/year

29 (a) $-$\$35 billion dollars
(b) $-$\$7 billion dollars per year
(c) Yes; 2006–2007, 2007–2008

31 (a) Negative
(b) -0.087 mg/hour

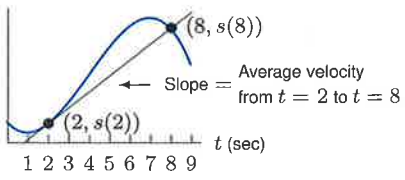
33 15.468, 57.654, 135.899, 146.353, 158.549 people/min

35 (a) -11 cm/sec
(b) -5.5 (cm/sec)/kg

37 (a) Concave up; no
(b) 2.6 m/sec

39 Decreasing, concave down

41 (a)



Section 1.1
#15
a) \$3500 in sales when \$1000 spent
(b) (I) more likely
(c) Sales when 0 is spent on advertising