

Math 1550 Answers to Homework—Even numbered problems 5.4-10.4

Chapter 6

§6.1 12.  $\begin{bmatrix} 2 & -5 \\ -5 & 8 \end{bmatrix}$ ; 20.  $A^T = A$ ; 26. no solution.

§6.2 12.  $\begin{bmatrix} 14 & -9 & 3 \\ -18 & 11 & -15 \\ -3 & 3 & 11 \end{bmatrix}$ ; 36.  $x \begin{bmatrix} 3 \\ 2 \end{bmatrix} + y \begin{bmatrix} 5 \\ -6 \end{bmatrix} = \begin{bmatrix} 16 \\ -4 \end{bmatrix}$ ; 40.  $x = 6, y = 3$

§6.3 22. 18; 24.  $\begin{bmatrix} 12 & 2 & 4 & -2 \\ 9 & 3 & 3 & 0 \\ 3 & 3 & 1 & 2 \end{bmatrix}$ ; 26. not defined; 28.  $\begin{bmatrix} 1 & 1 & 1 \\ 5 & 5 & 5 \end{bmatrix}$ ; 60.  $AX = b$ , where

$$A = \begin{bmatrix} 3 & 1 & 1 \\ 1 & -1 & 1 \\ 5 & -1 & 2 \end{bmatrix}, X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \text{ and } b = \begin{bmatrix} 2 \\ 4 \\ 12 \end{bmatrix}.$$

§6.4 14.  $x = -2/5, y = 53/15$ ; 16. no solution; 18.  $x = -\frac{13}{2}t + \frac{29}{2}, y = \frac{3}{2}t - \frac{9}{2}, z = t$ ; 20.  $x_1 = 3, x_2 = 1$ ; 22.  $x = 0, y = 2, z = -5$ ; 24.  $x = -3t - 1, y = -t + 2, z = t$ ; 26.  $x_1 = x_2 = x_3 = x_4 = 0$ ; 28. 2500 units of A, 2000 units of B.

§6.5 10. infinitely many solutions; 12. infinitely many solutions; 14. trivial solution; 16.  $x = \frac{5}{2}t, y = t$ ; 18.  $x = y = 0$ ; 20.  $x = y = z = 0$ ; 22.  $x = -3t, y = -4t, z = t$ ; 24.  $w = -r - 5s, x = -r - 2s, y = r, z = s$ .

§6.6 8. no inverse; 12.  $\frac{1}{15} \begin{bmatrix} 6 & -3 & 9 \\ 4 & 3 & -4 \\ -1 & 3 & 1 \end{bmatrix}$ ; 14.  $\begin{bmatrix} 7 & -8 & 5 \\ -4 & 5 & -3 \\ 1 & -1 & 1 \end{bmatrix}$ ; 24.  $x = 4, y = 7$ ; 26. no solution; 28.  $x = 1, y = 2, z = -1$ ; 32.  $x = 1, y = -t + 2, z = t$

Chapter 7:

§7.1 6.  $y \geq -\frac{3}{5}x + \frac{12}{5}$ ; 8.  $y < -\frac{1}{5} - 1$ ; 10.  $y > -\frac{2}{3} - 2, y > 3x - 6$ ; 12.  $y < \frac{3}{2}x + 3, x < 0$

§7.2 2.  $P = 450$  when  $x = 30, y = 50$ ; 4.  $Z = 3$  when  $x = 3, y = 0$ ; 6. empty feasible region; 8.  $Z = 0.8$  when  $x = 2, y = 0$ ; 16. 30 bags of Blend I and 10 bags Blend II, the minimal cost is \$340.

§7.3 2.  $Z = 12$  when  $x = \frac{2}{3} + \frac{14}{3}t, y = \frac{16}{3} - \frac{14}{3}t, 0 \leq t \leq 1$ .

Chapter 10:

§10.1 6. -4; 14. 3; 16.  $-7/2$ ; 18. -4; 20.  $3\sqrt{2}$ ; 22. 1; 24.  $-3/4$ ; 26. 4; 28. -2; 30.  $32/5$ ; 32. 2; 34. 4; 36.  $6x + 7$ ; 42.  $-2 - 6x$

§10.2 2. (a) 0 (b)  $-\infty$  (c) does not exist (d)  $\infty$  (e) 2 (f) 1 (g) 1 (h) 1; 4. 0; 6. 19; 8. -5; 16. 0; 18.  $-\infty$ ; 20. 0; 22. -1; 24.  $\infty$ ; 26. 0; 30.  $2/5$ ; 32.  $\infty$ ; 34. -3; 38.  $1/2$ ; 40. 4; 48. does not exist 54. -2; 56. (a) 2 (b) 1 (c) does not exist (d) 2 (e)  $-\infty$

§10.3 12. \$8264.94

§10.4 14. a polynomial function is continuous 16. a polynomial function is continuous 20. 2, -2; 24. 0, -1; 30. -1; 32. 2; 34. no discontinuity