

ECONOMICS 207  
SPRING 2008  
PROBLEM SET 4

**Problem 1.** Solve the following equations for  $x$ .

a.  $8x^2 - 22x + 15 = 0$

b.  $15x^2 - 145x + 90 = 0$

**Problem 2.** Solve the following equations for  $x_1$ .

a.  $81x_1^{-1/3} - 27 = 0$

b.  $50x_1^{-2/5} - 2 = 0$

**Problem 3.** Solve the following equations for  $x_1$ .

a.  $2x_1^{2/3} = x_1^{3/4}$

b.  $2x_1^{1/3} = 3x_1^{1/2}$

**Problem 4.** Solve the following systems of equations for  $x_1$  and  $x_2$  using the method of elimination.

a.

$$\begin{aligned}x_1 + x_2 &= 1 \\3x_1 + 2x_2 &= 4\end{aligned}$$

b.

$$\begin{aligned}x_1 - 3x_2 &= -9 \\2x_1 - 7x_2 &= -22\end{aligned}$$

c.

$$-x_1 + 5x_2 = 13$$

$$-x_1 + 4x_2 = 10$$

d.

$$2x_1 + 3x_2 = 4$$

$$5x_1 + 7x_2 = 9$$

e.

$$2x_1 + 2x_2 = 8$$

$$5x_1 + 4x_2 = 17$$

**Problem 5.** Solve the following systems of equations for  $x_1$ ,  $x_2$ , and  $x_3$  using the method of elimination.

a.

$$\{x_1 = 1, x_2 = 3, x_3 = -2\}$$

$$x_1 + 2x_2 - 2x_3 = 11$$

$$3x_1 + 7x_2 - 10x_3 = 44$$

$$3x_1 + 4x_2 + x_3 = 13$$

b.

$$\{x_1 = 2, x_2 = 2, x_3 = -1\}$$

$$\frac{1}{2}x_1 + 2x_2 + x_3 = 4$$

$$2x_1 + 10x_2 + 4x_3 = 20$$

$$3x_1 + 6x_2 + 7x_3 = 11$$



c.

$$\{x_1 = 1, x_2 = -1, x_3 = 2\}$$

$$3x_1 + \frac{1}{3}x_2 + 2x_3 = \frac{20}{3}$$

$$6x_1 + x_2 + 4x_3 = 13$$

$$-3x_1 - 2x_2 - 3x_3 = -7$$

**Problem 6.** Solve the following systems of equations for  $x_1$  and  $x_2$  using the method of substitution.

a.

$$24x_1^{-3/4}x_2^{1/2} - 9 = 0$$

$$48x_1^{1/4}x_2^{-1/2} - 32 = 0$$

b.

$$128x_1^{-3/5}x_2^{1/4} - 64 = 0$$

$$80x_1^{2/5}x_2^{-3/4} - 5 = 0$$

**Problem 7.** Do the following problems from the book.

a. Section 3.6

- 1) 1a
- 2) 1b
- 3) 3
- 4) 5

b. Section 4.2

- 1) 3b
- 2) 7a
- 3) 7b
- 4) 13

c. Section 4.4

- 1) 1a
- 2) 1b
- 3) 3
- 4) 7a
- 5) 7b
- 6) 7c
- 7) 7d

d. Section 4.5

- 1) 3
- 2) 5

e. Section 4.6 (Besides equation 2 on page 105 of the text, equation 5 on page 106 of the text is useful.)

- 1) 3a
- 2) 3c
- 3) 3d
- 4) 3e
- 5) 3f