Exercise session problems

Problem 1.

Solve the following systems of equations:

a) $2x + 3y = 14$	b) $x^2 + y^2 = 20$	c) $x - 2y = 6$	d) $x^2 - y^2 = 8$
7x - 4y = 20	x - y = 2	xy = -4	xy = 3

Problem 2.

Solve the equation ax = b when

a) $a = 4, b = 12$	b) $a = 4, b = 0$	c) $a = 0, b = 12$	d) $a = b = 0$
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Problem 3.

Solve the following systems of equations:

a) $x + y + z = 4$	b) $x - y + z = 3$
x + 2y + 4z = 9	2x - 4y + z = 1
x + 3y + 9z = 16	3x - 5y + 2z = 4

Problem 4.

Use Gaussian elimination to solve the following linear systems:

	x	+	y	+	z	=	11		x	+	y	+	z	=	6
a)	x	+	2y	+	4z	=	22	b)	x	+	2y	+	4z	=	16
	x	_	y	+	z	=	1		x	+	3y	+	9z	=	20

Problem 5.

Use Gaussian elimination to solve the following linear systems. How many solutions are there?

					_				2		_		x	+	\boldsymbol{u}	+	z	=	11
	x	+	3y	=	1		x	+	3y	=	7		r	_	<i>u</i>	+	7	=	9
a)	x	_	y	=	9	b)	x	—	y	=	3	c)	2m	1	9 24		~ 5~		44
	2x	+	2y	=	3		2x	+	2y	=	10		2x	+	$5\mathbf{y}$	+	32	_	44
			v						0				3x	—	\boldsymbol{u}	+	2z	=	45

Problem 6.

Use Gaussian elimination to solve the following linear systems. How many solutions are there?

	x	+	2y	+	3z	=	4		3x	+	4y	+	3z	=	2
a)	-x	—	y	+	z	=	1	b)	2x	_	y	+	z	=	1
	3x	+	4y	+	z	=	2		7x	+	2y	+	5z	=	3

Problem 7.

Use Gaussian elimination to solve the following linear system. How many solutions are there?

+10xy+zw= 72y+ 4z x+wx+z + 11w= 16y

Problem 8.

Solve the following system of equations:

$$2xy + y^3 + y^2 = 0$$
$$x^2 + 3xy^2 + 2xy = 0$$

Optional: Exercises from the Norwegian textbook

Textbook [E]:	Eriksen, Matematikk for økonomi og finans
Exercise book [O]:	Eriksen, Matematikk for økonomi og finans - Oppgaver og Løsningsforslag
Exercises:	[E] 6.1.1 - 6.1.6, 6.2.1 - 6.2.5
Solution manual:	See [O] Ch. 6.1 - 6.2

Answers to exercise session problems

Problem 1.

a)	(x,y) = (4,2)	b) $(x,y) = (4,2), (-2, -4)$
c)	(x,y) = (2, -2), (4, -1)	d) $(x,y = (3,1), (-3, -1)$

Problem 2.

a) x = 3

b) x = 0c) no solutions d) all *x*-values are solutions

Problem 3.

a) (x,y,z) = (1,2,1) b) (x,y,z) = (-3z/2 + 11/2, -z/2 + 5/2, z) where z is a free variable.

Problem 4.

a) (x,y,z) = (4,5,2) b) (x,y,z) = (-10,19,-3)

Problem 5.

a) No solutions b) One solution (x,y) = (4,1) c) No solutions

Problem 6.

a) Infinitely many solutions (x,y,z) = (-6 + 5z, 5 - 4z, z) with z free b) No solutions

Problem 7.

Infinitely many solutions (x,y,z) = (13 - 5w, -3 + 5w, -w, w) with w free

Problem 8.

Solutions: (x,y) = (0,0), (0, -1), (3/25, -3/5)