

CS 2200

HW 07

Fall 2024

Points:

Reference:

10 points

Epp5 Chapter.Sections: 4.8, 4.10

Textbook Problems:

Notation: Chapter.Section.Problem / Page

1. Epp5 problem 4.8.15 / p233
2. Epp5 problem 4.10.3 b / p255
3. Epp5 problem 4.10.5 / p255
4. Epp5 problem 4.10.7 / p255
5. Epp5 problem 4.10.15 / p255
6. Epp5 problem 4.10.16 / p255
7. Epp5 problem 4.10.18 / p255

Exps problem 4.8.15 / p233

Q.15 The product of two irrational numbers is irrational.

Let,

$$1. \frac{\sqrt{2}}{2}$$

$$2. \frac{\sqrt{2}}{2}$$

Product of irrational no.

$$\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{2}{2}$$

$$= 1$$

Since,

1 is a rational no., this counterexample shows that it is possible for the product of two numbers to be rational.
Conclusion:-

This statement is false.

2.8pps problem 4.10.3b/p255

⑤ $x=1, y=1$

So,

$$1 \cdot 1 > 0 \quad (\text{true})$$

y:

$$y = 3 \cdot x \\ = 3$$

Again

$$x = x + 1 \\ = 2$$

So,

$$z = x \cdot y \\ = 2 \cdot 3 \\ = 6$$

3.8pp5 problem 4.10.5 / p255

Trace table

K	e(before)	e(after)	f(before)	f(after)
1	2	$2-1=2$	0	$2+0=2$
2	2	$2-2=0$	2	$2+2=4$
3	4	$4-3=1$	6	$4+6=10$

After loop ends:-

$$R=12$$

$$f=18$$

4. Epps problem 4.10.7 / p 255

Trace Table:-

Iteration Number	a	d	q	r
0	59	13	0	59
1	59	13	1	46
2	59	13	2	33
3	59	13	3	20
4	59	13	4	7

S.Epps problem 4.10.15/10255

832 and 10933

$$\begin{array}{r} 832 \overline{) 10933} \quad 13 \\ \underline{10816} \\ 117 \end{array}$$

$$\begin{array}{r} 117 \overline{) 832} \quad 7 \\ \underline{819} \\ 13 \end{array}$$

$$\begin{array}{r} 13 \overline{) 117} \quad 9 \\ \underline{117} \\ 0 \end{array}$$

$$\text{GCD}(10,933, 832) = 13$$

6. Epps problem 4.10.16 / p255

$$\begin{array}{r} 2431 \overline{) 4131} \quad 1 \\ \underline{2431} \\ 1700 \end{array}$$

$$\begin{array}{r} 1700 \overline{) 2431} \quad 1 \\ \underline{1700} \\ 731 \end{array}$$

$$\begin{array}{r} 731 \overline{) 1700} \quad 2 \\ \underline{1462} \\ 238 \end{array}$$

$$\begin{array}{r} 238 \overline{) 731} \quad 3 \\ \underline{714} \\ 17 \end{array}$$

$$\begin{array}{r} 17 \overline{) 238} \quad 14 \\ \underline{238} \\ 0 \end{array}$$

$$\text{GCD}(4131, 2431) = 17$$

2) Epps problem 4/10/18/p255

Trace table for (5859, 1232)

Step	A	B	r	GCD
0	5859	1232		
1	5859	1232	1059	
2	1232	1059	173	
3	1059	173	21	
4	173	21	5	
5	21	5	1	
6	5	1	0	1