



CIS1910 Discrete Structures in Computing (I)

Winter 2019, Lab 1 Notes

Most/many of the practice exercises below have been covered in Lab 1.
Note that the examples and exercises listed in blue come from the following textbook:
 “Discrete Mathematics and Its Applications,” by Rosen, Mc Graw Hill, 7th Edition

A. TUPLES AND SETS

Examples, Section 2.1:

1, 2, 4, 6,
 10, 11, 12,
 14, 15,
 16, 17, 18, 19, 20

Exercises, Section 2.1:

3, 5, 7, 9, 11,
 19,
 21,
 27, 29, 33, 35, 37, 39

B. SOLVING EQUATIONS

1. Let a , b and c be real numbers.

1.1. True or false?

- | | |
|-------------------------------------|-----|
| If $a=b$ then $1/a=1/b$. | (1) |
| If $a=b$ then $a^2=b^2$. | (2) |
| If $a=b$ then $\sqrt{a}=\sqrt{b}$. | (3) |
| If $a=b$ then $ a = b $. | (4) |

$$\text{If } 1/a=1/b \text{ then } a=b. \quad (5)$$

$$\text{If } a^2=b^2 \text{ then } a=b. \quad (6)$$

$$\text{If } \sqrt{a}=\sqrt{b} \text{ then } a=b. \quad (7)$$

$$\text{If } |a|=|b| \text{ then } a=b. \quad (8)$$

$$\text{If } 1/a=b \text{ then } a=1/b. \quad (9)$$

$$\text{If } a^2=b \text{ then } a=\sqrt{b}. \quad (10)$$

$$\text{If } \sqrt{a}=b \text{ then } a=b^2. \quad (11)$$

$$\text{If } |a|=b \text{ then } a=b. \quad (12)$$

$$\text{If } a=b \text{ then } a+c=b+c. \quad (13)$$

$$\text{If } a=b \text{ then } a-c=b-c. \quad (14)$$

$$\text{If } a=b \text{ then } ac=bc. \quad (15)$$

$$\text{If } a=b \text{ then } a/c=b/c. \quad (16)$$

$$\text{If } a+c=b+c \text{ then } a=b. \quad (17)$$

$$\text{If } a-c=b-c \text{ then } a=b. \quad (18)$$

$$\text{If } ac=bc \text{ then } a=b. \quad (19)$$

$$\text{If } a/c=b/c \text{ then } a=b. \quad (20)$$

1.2. Complete and make it come true.

$$\text{If } a=b \text{ then } 1/a=1/b. \quad (21)$$

$$\text{If } a=b \text{ then } \sqrt{a}=\sqrt{b}. \quad (22)$$

$$\text{If } a^2=b^2 \text{ then } a=b \text{} \quad (23)$$

$$\text{If } |a|=|b| \text{ then } a=b \text{} \quad (24)$$

$$\text{If } a^2=b \text{ then } a=\sqrt{b} \text{} \quad (25)$$

$$\text{If } |a|=b \text{ then } a=b \text{} \quad (26)$$

$$\text{If } a=b \text{ then } a/c=b/c. \quad (27)$$

$$\text{If } ac=bc \text{ then } a=b \text{} \quad (28)$$

1.3. Complete and make it come true.

$$1/a=1/b \text{ iff } a=b \text{} \quad (29)$$

$$a^2=b^2 \text{ iff } a=b \text{} \quad (30)$$

$$\sqrt{a}=\sqrt{b} \text{ iff } a=b \text{} \quad (31)$$

$$|a|=|b| \text{ iff } a=b \text{} \quad (32)$$

$$1/a=b \text{ iff } a=1/b \dots\dots\dots (33)$$

$$a^2=b \text{ iff } a=\sqrt{b} \dots\dots\dots (34)$$

$$\sqrt{a}=b \text{ iff } a=b^2 \dots\dots\dots (35)$$

$$|a|=b \text{ iff } a=b \dots\dots\dots (36)$$

$$a+c=b+c \text{ iff } a=b \dots\dots\dots (37)$$

$$a-c=b-c \text{ iff } a=b \dots\dots\dots (38)$$

$$ac=bc \text{ iff } a=b \dots\dots\dots (39)$$

$$a/c=b/c \text{ iff } a=b \dots\dots\dots (40)$$

2. **Solve over** $\mathbb{R}$ the following equations in x , i.e., for each equality, find the set of all the elements x of $\mathbb{R}$ such that the equality holds (this set is called the **solution set**).

2.1. $2x-1=3$

2.2. $|3x+1|=4x+2$

2.3. $\sqrt{3x+7} = x+1$

2.4. $(x+2)^2 = 9$

2.5. $\frac{2x+1}{2x^2-13x-7} = 1$

2.6. $\sqrt{4x+3} = \sqrt{7x+9}$