PH Wu

Ch1. Real Numbers I – Test

Class: _____ Number: _____ Name: _____

Part A: True/False (10 pts each)

Instruction: Mark "T" for true or "F" for false.

( )1. 1.414 is an irrational number.

( )2. There is no integer that has a reciprocal that is an integer.

Part B: Multiple Choice (10 pts each)

Instruction: Select the best answer from the provided options. There is at least one correct answer for each question.

( ) 1. Let a and b be rational numbers, and c and d be irrational numbers. Which of the following statements is correct?

A) $a+c$ is an irrational number.

B) $c+d$ is an irrational number.

C) ac is an irrational number.

D) cd is an irrational number.

E) If $a \neq 0$, then $\frac{b}{a}$ is a rational number.

( ) 2. Let a and b be real numbers, with $2 \leq a \leq 5$ and $-3 \leq b \leq 4$. Which of the following statements is correct?

A) $-1 \leq a+b \leq 9$

B) $1 \leq a-b \leq 5$

C) $-15 \leq ab \leq 20$

D) $-\frac{2}{3} \leq \frac{a}{b} \leq \frac{5}{4}$

E) $9 \leq b^2 \leq 16$

Part C: Short Answer (10 pts each)

Instruction: Provide clear and concise answers to each of the questions.

1. Simplify the following expressions:

   i) $\sqrt{2}+\sqrt{8}+\sqrt{18}+\sqrt{32}$ ii) $\dfrac{\sqrt{5}}{\sqrt{3}}+\dfrac{\sqrt{3}}{\sqrt{5}}$

2. Let *a* and *b* be real numbers. Given $\left(2+\sqrt{3}\right)a+\left(1-\sqrt{3}\right)b=7-\sqrt{3}$, find the values of *a* and *b*.

3. Arrange π, $\sqrt{8}$, and $3.\overline{5}$ in order from greatest to least.

4. Let *a* and *b* be real numbers. Given $\left(a+b\right)^2+\left(a-2b+6\right)^2=0$, find the values of *a* and *b*.

Part D: Problem Solving (10 pts each)

Instruction: Show all the necessary steps. Neatness counts. Be sure to include units of measurement where relevant.

Use a ruler and compass to locate $\dfrac{3}{5}$ and $-\dfrac{3}{5}$ on the number line.

Ch1. Real Numbers I – Answer Key

Part A

1. F

2. F

Part B

1. AE

2. AC

Part C

1. i) $10\sqrt{2}$

   ii) $\frac{8}{15}\sqrt{15}$

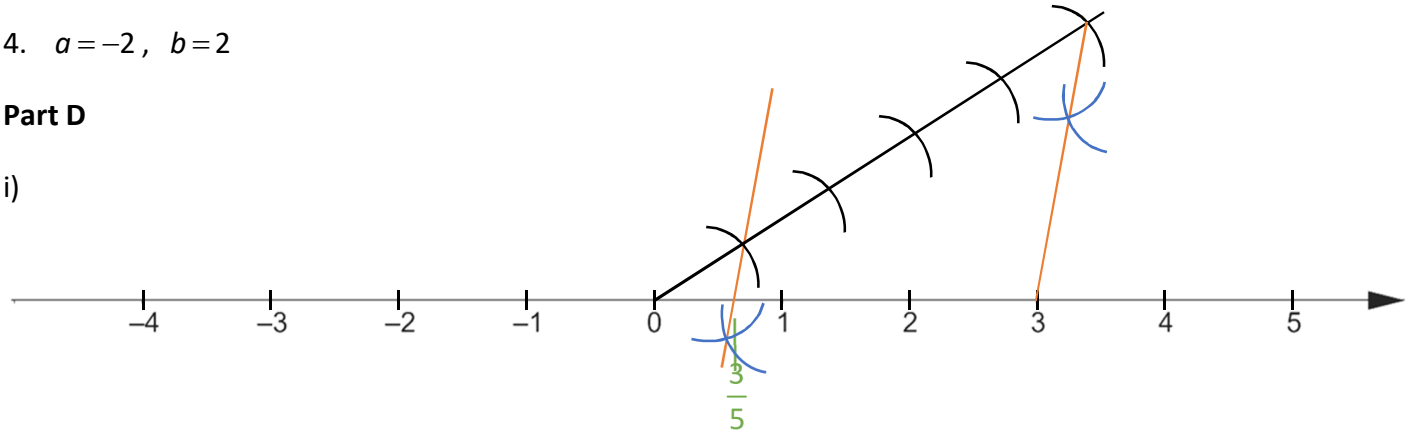
2. $a=2$, $b=3$

3. $3.\overline{5}>\pi>\sqrt{8}$

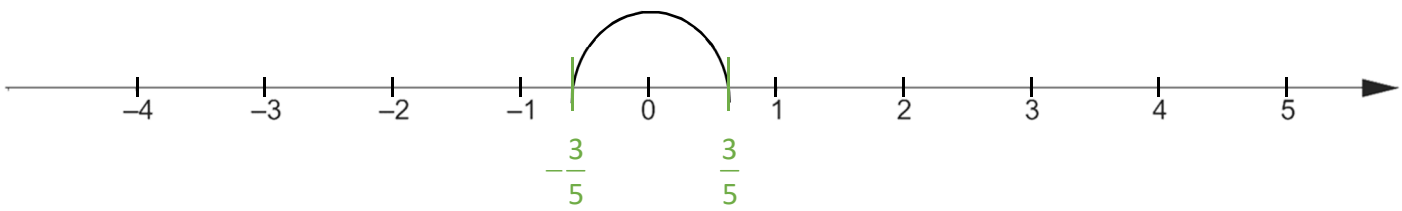
4. $a=-2$, $b=2$

Part D

i)



ii)



Ch1. Real Numbers I – Vocabulary

1. irrational number 無理數
2. integer 整數
3. reciprocal 倒數
4. rational number 有理數
5. ruler 尺
6. compass 圓規