TB(2B) Ch. 10 Pyth. Thm & Irrational Numbers
Rational and Irrational Numbers
Multiple Choice Questions

1. **[11-12 F.2 S. Test 2]**

   Which of the following must be rational?

   A. $9.8\dot{7}\dot{6}$

   B. $\sqrt{288}$

   C. $1.211\ 212\ 12\ldots$

   D. $\dfrac{\pi}{3.14}$

2. **[11-12 S. Test 2]**

   It is given that $a = \sqrt{5}$ and $b = \sqrt{7}$.
   Express $\sqrt{180} + \sqrt{140}$ in terms of a and b.

   A. $6a + 2b$

   B. $6a + 2ab$

   C. $36a + 4b$

   D. $36a + 4ab$

3. **[12-13 S. Test 2]**

   Which of the following is a rational number?

   A. $\dfrac{\pi}{2}$ B. $\sqrt{1000}$

   C. $\dfrac{2}{\sqrt{32}}$ D. $\sqrt{\dfrac{2401}{49}}$

4. **[12-13 S. Test 2]**

   It is given that $a = \sqrt{10}$ and $b = \sqrt{2}$. Express $\sqrt{\dfrac{1}{5}} + \sqrt{800}$ in terms of a and b.

   A. $\dfrac{a}{b} + 20b$ B. $\dfrac{b}{a} + 20b$

   C. $\dfrac{a}{b} + 40a$ D. $\dfrac{b}{a} + 40b$

5. **[12-13 Final Exam #6]**

   Which of the following statements is correct?

   A. Rational numbers are integers only.
   B. Recurring decimals are rational numbers.
   C. Irrational numbers must be positive numbers.
   D. All fractions are irrational numbers.

6. [12-13 Final Exam #19]

If $\sqrt{50} = a$, then $\sqrt{4.5} =$

A. $0.03a$.   B. $0.3a$.
C. $0.09a$.   D. $0.9a$.

7. [13-14 Standardized Test 2]

Which of the following is an irrational number?

A. $\dfrac{22}{7}$

B. 3.1415

C. $\sqrt{4} + \sqrt{12}$

D. $0.\dot{1}\dot{2} + 0.034\dot{5}$

8. [13-14 Standardized Test 2]

If $\dfrac{1}{a} + \dfrac{1}{b} = \dfrac{3\sqrt{2}}{4}$ and $\dfrac{1}{a^2} + \dfrac{1}{b^2} = \dfrac{5}{8}$, then $ab =$

A. $\dfrac{1}{4}$.   B. 1.

C. 4.   D. $\dfrac{15\sqrt{2}}{32}$.

9. [13-14 Final Exam, #2]

Simplify $\sqrt{75} + \sqrt{27} - \sqrt{60} \div \sqrt{5}$.

A. $\sqrt{3}$ B. $4\sqrt{3}$
C. $6\sqrt{3}$ D. $10\sqrt{3}$

10. [13-14 Final Exam, #14]

If $a = k + \sqrt{2}$ and $b = k - \sqrt{2}$ where k is an integer, which of the following is/are rational?
I. ab
II. $a + b$
III. $a^2 + b^2$

A. I only   B. II only
C. I and II only   D. I, II and III

11. [13-14 S.6 Mock Exam #8]

Simplify $\left(a^2 - \sqrt{3}a + 1\right)\left(a^2 + \sqrt{3}a + 1\right)$.

A. $a^4 - a^2 + 1$

B. $a^4 + a^2 + 1$

C. $a^4 - 2a^2 - 2\sqrt{3}a - 1$

D. $a^4 + \sqrt{3}a^2 - 2\sqrt{3}a + \sqrt{3}a + 1$

12. [14-15 Standardized Test #2]

For $a > b > c > 0$, which of the following must be true?

A. $\sqrt{-a} = -\sqrt{a}$

B. $\sqrt{\dfrac{a}{b}} = \sqrt{a} - \sqrt{b}$

C. $\sqrt{a+b} = \sqrt{a} + \sqrt{b}$

D. $\sqrt{abc} = \sqrt{a} \cdot \sqrt{b} \cdot \sqrt{c}$

13. [14-15 Standardized Test #10]

If $\dfrac{1}{a} - b = \sqrt{2}$ and $\dfrac{1}{a^2} + b^2 = \sqrt{5}$, then $\dfrac{b}{a} =$

A. $\dfrac{\sqrt{5}-2}{2}$.　　**B.** $\dfrac{\sqrt{5}+2}{2}$.

C. $\sqrt{5}-2$.　　**D.** $\sqrt{5}+2$.

14. [14-15 Final Exam #6]

Which of the following is an irrational number?

A. 0 　　　　　　　**B.** 3^{-2}

C. $\left(\dfrac{\pi}{3}\right)^0$ 　　　　　**D.** $\sqrt{242}$

15. [15-16 Final Exam #1]

Which of the following is an irrational number?

A. $2\sqrt{5} - \sqrt{5}$

B. 0.012345678901253

C. $1 + \pi^0$

D. $\sqrt{27} - 3\sqrt{3}$

16. [15-16 Standardized Test #6]

$\dfrac{2\sqrt{3}}{2-\sqrt{3}} =$

A. $6 + 4\sqrt{3}$.

B. $9 + 4\sqrt{3}$.

C. $-5 + \sqrt{3}$.

D. $-\dfrac{6+4\sqrt{3}}{5}$.

17. [15-16 Standardized Test #10]

$$\frac{1}{\sqrt{1}+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+...+\frac{1}{\sqrt{6}+\sqrt{7}}=$$

    A. $1-\sqrt{7}$.

    B. $\sqrt{7}-1$.

    C. $\frac{1}{28}$.

    D. $\frac{1}{\sqrt{3}+\sqrt{5}+\sqrt{7}+\sqrt{9}+\sqrt{11}+\sqrt{13}}$

~ End ~