Mathematics 1201 Quiz
Chapter 4.1-4.4

Name:_____

Part A: Place the correct letter in the space provided. (10 marks)

1.   Which number is irrational?   **B**

    A) $\sqrt[3]{-64}$ $= -4$

    B) $\sqrt{6}$ $= 2. \text{-----}$

    C) $\sqrt{\dfrac{81}{16}}$ $= \dfrac{9}{4}$

    D) $49^{\frac{1}{2}}$ $= 7$

2.   Which statement is true?   **D**

    A)   All integers are whole numbers.
    B) $\sqrt[3]{8}$ is irrational.
    C)   Irrational numbers are not real.
    D)   Natural numbers are in all number sets except irrational.

3.   Which group of numbers shows an arrangement from least   **C**
    to greatest?

    A) $\sqrt[3]{13}, \sqrt{18}, \sqrt{9}, \sqrt[4]{27}, \sqrt[3]{-5}$
    B) $\sqrt{2}, \sqrt[3]{-2}, \sqrt[3]{-6}, \sqrt{11}, \sqrt{30}$
    C) $\sqrt[3]{98}, \sqrt{40}, \sqrt[3]{300}, \sqrt[3]{500}, \sqrt{75}$
    D) $-\dfrac{14}{5}, \dfrac{123}{99}, 2, \sqrt[3]{-10}, \sqrt{4}$

4. Which radical is written in the correct simplified form? **_A_**

     A) $\sqrt{12} = 2\sqrt{3}$

     B) $\sqrt{25} = 5\sqrt{5}$

     C) $\sqrt{32} = 4\sqrt{8}$

     D) $\sqrt[3]{54} = 3\sqrt{2}$

$$\sqrt{12} = \sqrt{4 \cdot 3} = 2\sqrt{3}$$
$$\sqrt{25} = 5$$
$$\sqrt{32} = \sqrt{16 \cdot 2} = 4\sqrt{2}$$
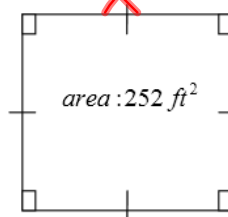
5. Write $2\sqrt[3]{12}$ as an entire radical. **_D_**

     A) $4\sqrt{3}$

     B) $\sqrt{96}$

     C) $\sqrt[3]{72}$

     D) $\sqrt[3]{96}$

$$2\sqrt[3]{12}$$

$$\sqrt[3]{2^3} \cdot \sqrt[3]{12} = \sqrt[3]{2^3 \cdot 12} = \sqrt[3]{8 \cdot 12}$$

6. Express the side length of this square as a radical in simplest form. **____**

     A) $4\sqrt{252}$

     B) $\sqrt{252}$

     C) $6\sqrt{7}$

     D) $36\sqrt{7}$

$$\sqrt{252}$$
$$\sqrt{36 \cdot 7}$$
$$6\sqrt{7}$$

area : 252 ft²

$$x^2 = 252$$
$$x = \sqrt{252}$$

7. Which number represents the index? **_B_**

$$\sqrt[3]{4^2}$$

     A)   2

     B)   3

     C)   4

     D)   16

8. Write $x^{\frac{3}{2}}$ in simplest radical form.

     A) $x\sqrt{x}$

     B) $\sqrt{x^3}$

     C) $\sqrt[3]{x^2}$

     D) $\sqrt[2]{x^3}$

$$\sqrt[2]{x^3} \qquad \sqrt{x^3}$$

B (handwritten)

9. Evaluate $\left(\dfrac{9}{16}\right)^{0.5}$

     A) $\dfrac{3}{4}$

     B) $\dfrac{4.5}{8}$

     C) $\dfrac{4}{3}$

     D) $\dfrac{8}{4.5}$

A (handwritten)

$$\left(\frac{9}{16}\right)^{\frac{1}{2}} = \sqrt{\frac{9}{16}} = \frac{3}{4}$$

10. Evaluate $(-27)^{\frac{2}{3}}$

     A) -9

     B) -3

     C) 9

     D) 18

C (handwritten)

$$\left(\sqrt[3]{-27}\right)^2$$

$$(-3)^2 = 9$$

Part B: Show all working to receive full marks. (15 marks)

1. Arrange these numbers in order from greatest to least without using a calculator. Show the method used to receive full marks. (4 marks)

highest to lowest (handwritten)

$$5\sqrt{2}, \quad 2\sqrt{6}, \quad 7\sqrt{3}, \quad 3\sqrt{7}, \quad 4\sqrt{5}$$

$$\sqrt{5^2 \cdot 2} \qquad \sqrt{2^2 \cdot 6} \qquad \sqrt{7^2 \cdot 3} \qquad \sqrt{3^2 \cdot 7} \qquad \sqrt{4^2 \cdot 5}$$

$$\sqrt{25 \cdot 2} \qquad \sqrt{4 \cdot 6} \qquad \sqrt{49 \cdot 3} \qquad \sqrt{9 \cdot 7} \qquad \sqrt{16 \cdot 5}$$

$$\sqrt{50} \qquad \sqrt{24} \qquad \sqrt{147} \qquad \sqrt{63} \qquad \sqrt{80}$$

highest → lowest $7\sqrt{3}, \ 4\sqrt{5}, \ 3\sqrt{7}, \ 5\sqrt{2}, \ 2\sqrt{6}$

2. Evaluate each of the following without a calculator. Show the steps used to receive full marks.

(a) $64^{\frac{4}{3}}$ $\left(\sqrt[3]{64}\right)^4 = 4^4 = 256$ (2 marks)

$$\begin{array}{r} 64 \\ \underline{\times\ 4} \\ 240 \\ \underline{16} \\ 256 \end{array}$$

(b) $\left(\frac{81}{100}\right)^{\frac{3}{2}} = \left(\sqrt{\frac{81}{100}}\right)^3 = \left(\frac{9}{10}\right)^3 = \frac{729}{1000}$ (2 marks)

(c) $49^{1.5} = 49^{\frac{3}{2}} = \left(\sqrt{49}\right)^3$ (2 marks)

$(7^2)^{\frac{3}{2}} \longrightarrow = (7)^3 = 343$

$$\begin{array}{r} 49 \\ \underline{\times\ 7} \\ 280 \\ \underline{63} \\ 343 \end{array}$$

(d) $0.125^{\frac{2}{3}}$ (2 marks)

$$\left(\frac{125}{1000}\right)^{\frac{2}{3}} = \left(\sqrt[3]{\frac{125}{1000}}\right)^2 = \left(\frac{5}{10}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$$

(e) $6.25^{0.75}$ (3 marks)

$$\left(\frac{625}{100}\right)^{\frac{3}{4}} = \left(\sqrt[4]{\frac{625}{100}}\right)^3 = \frac{\left(\sqrt[4]{625}\right)^3}{\left(\sqrt[4]{100}\right)^3} = \frac{5^3}{\left(\sqrt[4]{100}\right)^3} = \frac{125}{\left(\sqrt[4]{100}\right)^3}$$

$$\left(\sqrt[4]{6.25}\right)^3$$

$\boxed{3.95}$