

Mathematics 1201

Test #2

CHAPTER 4: ROOTS AND POWERS

NAME: _____

PART A: Place your answer in the space at the right.

[Value: 16]

1. Which is the lowest common multiple [LCM] for 10 and 30? 1. _____

- (A) 2 (B) 10 (C) 30 (D) 300

2. Arrange $\sqrt[3]{64}$, $\sqrt{121}$, $\sqrt[4]{81}$ from least to greatest. 2. _____

(A) $\sqrt[3]{64}$ $\sqrt{121}$ $\sqrt[4]{81}$ (B) $\sqrt[4]{81}$ $\sqrt[3]{64}$ $\sqrt{121}$

(C) $\sqrt{121}$ $\sqrt[3]{64}$ $\sqrt[4]{81}$ (D) $\sqrt{121}$ $\sqrt[4]{81}$ $\sqrt[3]{64}$

3. Express $\sqrt[3]{24}$ as a mixed radical in simplest form. 3. _____

(A) $8\sqrt[3]{3}$ (B) $2\sqrt[3]{3}$ (C) $2\sqrt[3]{6}$ (D) $6\sqrt[3]{4}$

4. Write $2\sqrt[4]{5}$ as an entire radical. 4. _____

(A) $\sqrt[4]{80}$ (B) $\sqrt[4]{10}$ (C) $\sqrt[4]{40}$ (D) $\sqrt[4]{7}$

5. Which radical is equivalent to $(0.081)^{\frac{2}{3}}$? 5. _____

(A) $\left(\sqrt{\frac{81}{100}}\right)^3$ (B) $\left(\sqrt[3]{\frac{81}{100}}\right)^2$ (C) $\left(\sqrt{\frac{81}{1000}}\right)^3$ (D) $\left(\sqrt[3]{\frac{81}{1000}}\right)^2$

6. Which is equivalent to $(-7)^{-2}$? 6. _____

(A) $-\frac{1}{14}$ (B) $-\frac{1}{49}$ (C) $\frac{1}{14}$ (D) $\frac{1}{49}$

7. Evaluate: $\left(-\frac{5}{2}\right)^{-3}$ 7. _____

(A) $-\frac{125}{8}$ (B) $-\frac{8}{125}$ (C) $\frac{125}{8}$ (D) $\frac{8}{125}$

8. Evaluate: $64^{\frac{2}{3}}$ 8. _____

(A) 4 (B) 8 (C) 16 (D) 512

9. Which of the following is an irrational number? 9. _____

(A) $-\frac{1}{3}$ (B) $\sqrt[3]{25}$ (C) $\sqrt[4]{81}$ (D) $\sqrt{\frac{49}{16}}$

10. Simplify: $(2x^7y)(4x^2y^4)$ 10. _____

(A) $6x^9y^5$ (B) $6x^{14}y^4$ (C) $8x^{14}y^4$ (D) $8x^9y^5$

11. Simplify: $\frac{m^3 \cdot m^{-4}}{m^{-6}}$ 11.____

- (A) m^3 (B) $\frac{1}{m^5}$ (C) m^6 (D) m^5

12. Simplify: $(-3x^4)^3$ 12.____

- (A) $-27x^7$ (B) $-3x^{12}$ (C) $-27x^{12}$ (D) $3x^7$

13. Evaluate: $\frac{(2^3)^4(2^5)}{(2^4)^4}$ 13.____

- (A) 2^0 (B) 2^1 (C) 2^4 (D) 2^9

14. Simplify $\frac{6a^2b^{-3}}{18ab^2}$ using powers with positive exponents. 14.____

- (A) $3ab^5$ (B) $\frac{ab^5}{3}$ (C) $\frac{3a}{b^5}$ (D) $\frac{a}{3b^5}$

15. Evaluate: $\frac{\left(\frac{4}{9}\right)^{\frac{3}{2}}}{\left(\frac{4}{9}\right)^{-\frac{1}{2}}}$ 15.____

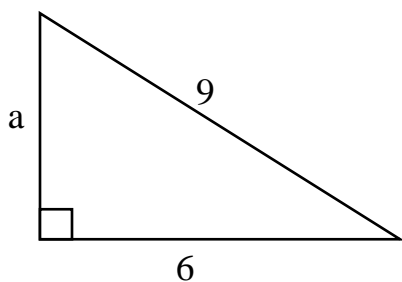
- (A) $\frac{4}{9}$ (B) $\frac{16}{81}$ (C) $\frac{8}{18}$ (D) $\frac{2}{3}$

16. Simplify: $(16a^8b^{20})^{\frac{1}{4}}$ 16.____

- (A) $16a^2b^5$ (B) $4a^{12}b^{24}$ (C) $4a^2b^5$ (D) $2a^2b^5$

PART B: Show all workings in the space provided to ensure full marks! [Value: 25]

17. Determine the value of **a** and express your answer in simplest radical form. [3]



18. A cube has a volume of 216 cm^3 .

- (a) Determine the edge length of the cube. [1] (b) Determine the Surface Area of the cube. [2]

19. Express the following as a radical then determine the EXACT value of each expressed as a fraction where applicable. [9]

(a) $(-27)^{\frac{2}{3}}$

(b) $(0.36)^{-1.5}$

(c) $\frac{0.04^{\frac{3}{2}}}{0.04^{\frac{4}{2}}}$

20. Simplify the following expressions. Express your answer with positive exponents.

(a) $(x^{-5}y^{-2})^{-3}(3x^4y^{-6})^2$

[3]

$$(b) \frac{(xy)^2(2x^2y^3)^3}{4xy^2}$$

[3]

$$(c) \left(\frac{-64a^6b^{12}c^3}{27a^{15}b^9c^9} \right)^{\frac{1}{3}}$$

[4]

21. Identify the step where the first error occurred and provide the correct solution.

[4]

$$\frac{(x^4y^{-2})^2}{(3x^4y^{-4})^3}$$

Identify correct step and provide correct solution:

Step I: $\frac{x^8y^{-4}}{3x^{12}y^{-12}}$

Step I:

Step II: $\frac{x^{8-12}y^{-4-(-12)}}{3}$

Step II:

Step III: $\frac{x^{-4}y^8}{3}$

Step III:

Step IV: $\frac{y^8}{3x^4}$

Step IV:

BONUS: All or Nothing [Value: 2]

Completely simplify expressing the final answer with positive exponents.

$$\left(\frac{-32x^{20}y^{15}z^{10}}{x^5y^{-10}z^5} \right)^{-\frac{1}{5}} \left(\frac{-125x^{12}y^9z^{-3}}{x^{-3}y^3z^{-6}} \right)^{\frac{1}{3}}$$

ANSWERS:

1. C 2. B 3. B 4. A 5. D 6. D 7. B 8. C

9. B 10. D 11. D 12. C 13. B 14. D 15. B 16. D

17. $3\sqrt{5}$

18.(a) 6 cm (b) 216 cm^2

19.(a) 9 (b) $\frac{125}{27}$ (c) 5

20.(a) $\frac{9x^{23}}{y^6}$ (b) $2x^7y^9$ (c) $-\frac{4b}{3a^3c^2}$

21. Error in Step I. Final answer $\frac{y^8}{27x^4}$

BONUS: $\frac{5x^2}{2y^3}$