Mathematics 1201 Final Exam Review
Roots and Powers

1. Which of these numbers is rational?

A) $\sqrt{48}$ B) $\sqrt{8.1}$ C) $\sqrt[3]{-16}$ D) $\sqrt{\frac{4}{169}}$

2. Which of these numbers is irrational?

A) -68 B) $\sqrt{48}$ C) $\sqrt[3]{216}$ D) $\sqrt{\frac{49}{16}}$

3. Determine which of these numbers is the least.

A) $\sqrt[4]{100}$ B) $\sqrt[3]{30}$ C) $\sqrt{14}$ D) $\sqrt[3]{75}$

4. Which of these numbers is a natural number?

A) 9 B) 0 C) $1.\overline{8}$ D) -1

5. What is the index of $\sqrt[3]{2^7}$?

A) 2^7 B) 3 C) 7 D) 2

6. What is the radicand of $\sqrt[6]{4^8}$?

A) 4 B) 4^8 C) 6 D) 8

7. Write $\sqrt{108}$ in simplest form.

A) $3\sqrt{12}$ B) $6\sqrt{3}$ C) $36\sqrt{3}$ D) $3\sqrt{6}$

8. Write $3\sqrt[3]{4}$ as an entire radical.

A) $\sqrt[3]{108}$ B) $\sqrt[3]{144}$ C) $\sqrt[3]{36}$ D) $\sqrt[3]{192}$

9. A square as an area of 12 square inches. What is the side length of the square as a radical in simplest form.

A) $4\sqrt{3}$ in. B) $2\sqrt{6}$ in. C) $3\sqrt{2}$ in. D) $2\sqrt{3}$ in.

10. What is the value of $64^{\frac{1}{3}}$?

A) 8 B) 4 C) -4 D) $21\frac{1}{3}$

11. What is $42^{\frac{5}{4}}$ as a radical?

A) $\sqrt[5]{42^4}$ B) $\left(\sqrt[4]{42}\right)^5$ C) $\sqrt[\frac{5}{4}]{42}$ D) $\left(\sqrt[5]{42}\right)^4$

12. What is $\sqrt{\left(\frac{3}{4}\right)^9}$ as a power?

A) $\left(\frac{3}{4}\right)^{\frac{-9}{2}}$ B) $\left(\frac{3}{4}\right)^{\frac{9}{2}}$ C) $\left(\frac{4}{3}\right)^{\frac{-2}{9}}$ D) $\left(\frac{3}{4}\right)^{\frac{2}{9}}$

13. Write $2a^{-3}$ without a negative exponent.

A) $\frac{1}{2a^3}$ B) $\frac{a^{-3}}{2}$ C) $\frac{2}{a^3}$ D) $\frac{2}{a^{-3}}$

14. $\left(\frac{3}{5}\right)^{-2}$ is equivalent to

A) $\frac{25}{9}$ B) $\frac{9}{25}$ C) $\frac{6}{10}$ D) $\frac{10}{6}$

15. Simplify $\frac{12p^3q^{-7}}{15pq^6}$. Write using powers with positive exponents.

A) $\frac{4p^3}{5q^{13}}$ B) $\frac{p^2}{3q^{13}}$ C) $\frac{4p^2}{5q}$ D) $\frac{4p^2}{5q^{13}}$

Section B:

1. Simplify the following:

A) $\frac{-12a^{-3}b^{-7}c^{-6}}{3a^{-6}b^{-3}c^{-3}}$	B) $\frac{(8x^{-3}y^{-2})^2}{(2xy^7)^5}$	C) $\left(x^{\frac{1}{2}}\right)^{\frac{1}{4}}(x^7)^{\frac{1}{8}}$
D) $\frac{(3x^3y)^0(x^{-2}y^3)^5}{(x^{-7}y)^3}$	E) $\sqrt[5]{p^3} \times \sqrt[3]{p}$	F) $m^{-6}n^3p^{-4} \times m^{-2}np^{-2}$

2. Identify the errors in the following and write a correct solution.

$(x^{-6}y^6)(x^{-3}y^5) = x^{-6} \cdot x^{-3}y^6 \cdot y^5$

$= x^{18} \cdot y^{30}$