Math 1201 : Roots and Powers **4.5 and 4.6 *SAMPLE TEST***

Section A: Place the letter which corresponds to the correct answer in the space at the right. (5 Marks)

1. Evaluate: $8^{-\frac{1}{3}}$ 1. C

(A) $-\frac{8}{3}$ (B) -2 C) $\frac{1}{2}$ (D) $-\frac{1}{2}$

2. Which is equivalent to $\left(\frac{2}{3}\right)^{-4}$? 2. A

(A) $\left(\frac{3}{2}\right)^{4}$ (B) $\left(\frac{2}{3}\right)^{4}$ (C) $\left(-\frac{2}{3}\right)^{\frac{1}{4}}$ (D) $\left(-\frac{3}{2}\right)^{\frac{1}{4}}$

3. Simplify: $(6xy^3)(3x^5y^2)$ 3. D

(A) $9x^5y^6$ (B) $9x^6y^5$ (C) $18x^5y^6$ (D) $18x^6y^5$

4. What is $5x^{-1}$ written with positive exponents? 4. C

(A) $5x$ (B) $\frac{1}{5x}$ (C) $\frac{5}{x}$ (D) $-5x$

5. Simplify: $\frac{15y^7}{5y^{-2}}$ 5. D

(A) $12y^9$ (B) $12y^5$ C) $3y^5$ (D) $3y^9$

Section B: Constructed Response (28 Marks)
Answer all of the following questions showing all work.

6. Evaluate each power without using a calculator: (3 Marks)

A) $49^{-\frac{1}{2}}$

$\left(\frac{1}{49}\right)^{\frac{1}{2}} = \sqrt{\frac{1}{49}} = \frac{1}{7}$

B) $16^{-\frac{5}{4}}$

$\left(\frac{1}{16}\right)^{\frac{5}{4}} = \left(\sqrt[4]{\frac{1}{16}}\right)^{5} = \left(\frac{1}{2}\right)^{5} = \frac{1}{32}$

C) $\left(\frac{25}{36}\right)^{-\frac{1}{2}}$

$\left(\frac{36}{25}\right)^{\frac{1}{2}} = \sqrt{\frac{36}{25}} = \frac{6}{5}$

7. Simplify the following, writing all answers with positive exponents. (20 Marks)

(A) $\left(\frac{x^{-2}y^5}{xy^7}\right)^3$ [4]

$= \frac{1}{x^9y^6}$

(B) $\frac{(6x^3)^2}{3x^{-1}}$ [3]

$= 12x^7$

(C) $\dfrac{12x^{\frac{1}{2}}}{18x^{-\frac{5}{2}}}$ [3]

$= \dfrac{2}{3}x^{3}$

(D) $m^{4}n^{-2} \bullet m^{2}n^{3}$ [2]

$= m^{6}n$

(E) $\dfrac{9^{\frac{7}{4}} \cdot 9^{-\frac{1}{4}}}{9^{\frac{3}{2}}}$ [4]

$= 1$

(F) $\left(\dfrac{c^{10}m^{6}}{36c^{-8}m^{-2}}\right)^{\frac{1}{2}}$ [4]

$= \dfrac{1}{6}c^{9}m^{4}$

8. Use the formula $v = 0.155s^{\frac{5}{3}}f^{-\frac{7}{6}}$ to estimate the speed of a dinosaur when s = 1.5 and f = 0.3. (2 Marks)

v = 1.2

9. Identify any errors in the solution below and then write a correct solution. (3 marks)

errors

$\dfrac{10x^{2}y^{3}}{2x^{5}y^{-2}} = 8x^{2-5}y^{3-2}$

$= 8x^{-3}y^{1}$

$= \dfrac{8y}{x^{3}}$

Correct Answer:

$= 5x^{2-5}y^{3+2}$

$= 5x^{-3}y^{5}$

$= \dfrac{5y^{5}}{x^{3}}$