Sample Exam 1

MAT 1275 Spring 2012

1. Evaluate:

$$\left(\frac{2^{-1}}{5^{-2}}\right)^2$$

2. Simplify. Express your solutions using positive exponents only.

(a) $\dfrac{a^3 b^{-2}}{a^{-2} b^{-4}}$

(b) $(3ab^{-1})(4a^{-3}b^3)$

(c) $\dfrac{-84ab^{-5}}{6a^3 b^{-7}}$

(d) $\left(\dfrac{25x^{-1}y^{-5}}{x^{-4}x^{-6}}\right)^{-2}$

(e) $\left(\dfrac{a^{1/3}b^{1/2}}{c^{5/8}}\right)^4$

(f) $\dfrac{4x^2 y^2}{9x^3} \div \dfrac{8y^2}{27xy}$

3. Simplify.

(a) $\dfrac{2a+1}{3} + \dfrac{5a-4}{3}$

(b) $\dfrac{2a-1}{4} + \dfrac{3a+2}{6}$

(c) $\dfrac{2n}{n^2-25} + \dfrac{3}{4n+20}$

(d) $\dfrac{1}{2} - 18k$

(e) $\dfrac{\dfrac{18a^3}{b^2}}{\dfrac{6a^2}{b}}$

(f) $\dfrac{\dfrac{6}{a} - \dfrac{5}{b^2}}{\dfrac{12}{a^2} + \dfrac{2}{b}}$

4. Solve these equations. Be sure to check your solution(s).

(a) $\dfrac{2}{3x} = \dfrac{7}{2x} + \dfrac{3}{5}$

(b) $\dfrac{2}{3x} + \dfrac{1}{4} = \dfrac{11}{6x} - \dfrac{1}{3}$

(c) $\dfrac{1}{n-1} + 1 = \dfrac{1}{n^2-n}$

5. Express in simplest radical form. Assume all variables represent positive values.

(a) $\sqrt{180}$

(b) $\sqrt{63x^2y^8}$

(c) $\sqrt[4]{32a^7b^{19}}$

(d) $\sqrt{\dfrac{4h}{100h^5}}$

(e) $\sqrt[3]{p^{11}q^{10}}$

6. Write in radical form.

   (a) $3x^{1/3}$

   (b) $4(ab)^{3/2}$

7. Add or subtract the radical expressions as indicated.

   (a) $-3\sqrt{4x} + 2\sqrt{16x} + 6\sqrt{9x}$

   (b) $\sqrt{12t} - \sqrt{27t} + 5\sqrt{3t}$

   (c) $w\sqrt{80} - 3\sqrt{125w^2}$