

Sample Exam 1

MAT 1275 Fall 2016

1. Evaluate:

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

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

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

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

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

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

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

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

3. Simplify.

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

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

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

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

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

$$(f) \frac{\frac{6}{12} - \frac{5}{2}}{a^2 + \frac{1}{b}}$$

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

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

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

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

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

$$(a) \sqrt{x^2y^4}$$

(b) $\sqrt{9x^2y^4z^2}$

(c) $\sqrt{\frac{h^2k^4}{16}}$

6. Write in radical form.

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

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

(c) $6y^{3/4}$

7. Write using rational exponents rather than radical notation.

(a) $\sqrt[4]{a^2b^3}$

(b) $-2\sqrt[3]{t}$

8. Simplify.

(a) $\left(\frac{100}{9}\right)^{-3/2}$

(b) $81^{-3/4}$

(c) $-25^{-3/2}$

(d) $\frac{1}{36^{-1/2}}$