

MATH 103
FALL 2013
EXAM 3

NAME:

1. 10 pts. each Write in lowest terms.

(a) $\frac{8x^2 - 10x - 3}{8x^2 - 6x - 9}$

(b) $\frac{r^3 - s^3}{r - s}$

2. 10 pts. each Multiply or divide as indicated, and write in lowest terms.

(a) $\frac{a^2 - 1}{4a} \cdot \frac{2}{1 - a}$

(b) $(8y - 16) \div \frac{3y - 6}{10}$

3. 10 pts. each Add or subtract as indicated, and write in lowest terms.

(a) $\frac{3}{z - 3} - \frac{1}{z}$

(b) $\frac{4}{w + 3} - \frac{w}{w - 3} - \frac{18}{w^2 - 9}$

4. 10 pts. Simplify the complex fraction:

$$\frac{q - \frac{q - 3}{3}}{\frac{4}{9} + \frac{2}{3q}}$$

5. 10 pts. each Solve each equation.

(a) $p + \frac{15}{p} = -8$

(b) $\frac{5}{t} + \frac{4}{6 - 3t} = \frac{2t}{6 - 3t}$

6. 10 pts. Solve for n : $I = \frac{nE}{R + nr}$.

7. 15 pts. Whilst on vacation, Oliver and Stanley decided to drive all day. During the first part of their trip on the highway, they averaged 90 km/h. When they got to Medicine Hat, traffic caused them to average only 45 km/h. The distance they drove in Medicine Hat was 150 km less than their distance on the highway. What was their total driving distance if they spent 50 minutes more on the highway than they did in Medicine Hat?

8. 10 pts. If a vat of acid can be filled by an inlet pipe in 10 hours and emptied by an outlet pipe in 14 hours, how long will it take to fill the vat if both pipes are open?
9. 10 pts. each Solve each system of equations. If the system is inconsistent or has dependent solutions, say so.
- (a)
$$\begin{cases} 3x + 2y = 13 \\ 4x - y = -1 \end{cases}$$
- (b)
$$\begin{cases} \frac{1}{4}x - \frac{1}{5}y = 9 \\ 5x - y = 0 \end{cases}$$
10. 10 pts. Simplify the root $\sqrt[6]{x^{30}}$.
11. 10 pts. Write with radicals: $(5u)^{-3/5}$.
12. 10 pts. each Simplify each expression. Write all answers with positive exponents. Assume that all variables represent positive real numbers.
- (a) $b^{2/3} \cdot b^{-1/6}$
- (b) $\frac{c^{1/6}h^{-5/6}}{(c^3h)^{1/3}}$

FORMULAS:

$$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$$

$$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$$