

Math 103
Summer II 2011
Exam #3

Name:

1. 15 pts. A plane averaged 500 mph on a trip going east, but only 350 mph on the return trip. The total flying time in both directions was 8.5 hours. What was the one-way distance?
2. 10 pts. Tom and Jerry are laying a hardwood floor. Working alone, Jerry can do the job in 20 hours. If the two of them work together, they can complete the job in 12 hours. How long would it take Tom to lay the flooring working alone?
3. 10 pts. each Solve each system of equations. If the system is inconsistent or has dependent solutions, say so.
 - (a)
$$\begin{cases} 3x - 2y = 7 \\ 2x + y = 3 \end{cases}$$
 - (b)
$$\begin{cases} \frac{1}{4}x - \frac{1}{5}y = 9 \\ 5x - y = 0 \end{cases}$$
4. 5 pts. each Simplify each root.
 - (a) $\sqrt[6]{(-9)^6}$
 - (b) $\sqrt{(-r)^2}$
5. 5 pts. each Evaluate each exponential (show work, since you're supposed to be doing these by hand).
 - (a) $49^{3/2}$
 - (b) $81^{-3/4}$
6. 10 pts. each Simplify each expression. Write all answers with positive exponents. Assume that all variables represent positive real numbers.
 - (a) $r^{-8/9} \cdot r^{19/9}$
 - (b) $\frac{m^{3/4}n^{-1/4}}{(m^2n)^{1/2}}$
7. 10 pts. each Simplify. Assume variables represent positive numbers.
 - (a) $\sqrt{300}$
 - (b) $\sqrt{121x^2y^5}$
 - (c) $\sqrt[3]{-24t^5z^7}$
 - (d) $\sqrt{\frac{u^3}{81}}$
 - (e) $3\sqrt{8} + 8\sqrt{72} - 3\sqrt{18}$
8. 10 pts. Multiply, and then simplify the product:
$$(2\sqrt{3} + \sqrt{5})(3\sqrt{3} - 2\sqrt{5})$$
9. 10 pts. each Rationalize the denominator in each expression. Assume variables represent positive numbers.
 - (a) $\frac{8}{\sqrt{24}}$
 - (b) $\frac{4}{2 - \sqrt{3}}$
10. 10 pts. each Solve each charming little radical equation.
 - (a) $6 - \sqrt{4y - 1} = 0$
 - (b) $\sqrt{7z + 1} = z + 1$
11. 10 pts. each Subtract, multiply or divide the complex numbers as indicated, and write your answers in the form $a + bi$.
 - (a) $(9 + 11i) - (5 + 6i)$
 - (b) $3i(4 - 9i)$
 - (c) $\frac{2 - i}{1 + i}$
12. 10 pts. each Solve each enchanting little quadratic equation using the quadratic formula.
 - (a) $(x - 3)(x + 4) = 2$
 - (b) $x^2 + 4x + 9 = 0$