

MATH 103
SPRING 2014
EXAM 4

NAME:

1. 10 pts. each Simplify. Assume all variables represent positive numbers.

(a) $\sqrt{242}$

(b) $\sqrt{98u^2w^5}$

(c) $\sqrt[3]{54t^6z^4}$

(d) $\sqrt{\frac{u^3}{81}}$

(e) $3\sqrt{8} + 13\sqrt{72} - 3\sqrt{18}$

2. 10 pts. Multiply, then simplify the product:

$$(2\sqrt{3} + \sqrt{6})(2\sqrt{3} - \sqrt{6})$$

3. 10 pts. each Rationalize the denominator in each expression. Assume variables represent positive numbers.

(a) $\frac{8}{\sqrt{24}}$

(b) $\frac{5}{\sqrt{3} - 1}$

4. 10 pts. each Solve each charming little radical equation.

(a) $\sqrt{9 - x} = x + 3$

(b) $\sqrt[3]{2y - 1} = \sqrt[3]{y + 15}$

5. 10 pts. Multiply, then simplify the product:

$$\sqrt{-7} \cdot \sqrt{-15}$$

6. 10 pts. Find i^{89} .

7. 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) $3i(4 - 9i)$

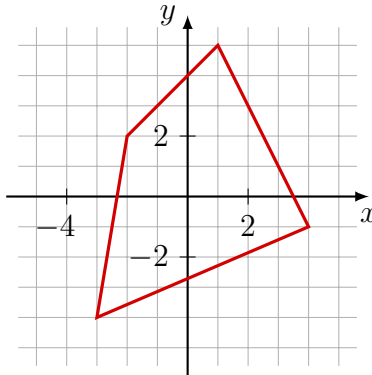
(c) $\frac{3 - i}{1 + i}$

8. 10 pts. each Solve each enchanting little quadratic equation using the quadratic formula.

(a) $(x - 3)(x + 4) = 2$

(b) $x^2 + 4x + 9 = 0$

9. 10 pts. Determine whether the relation given by the graph below defines a function, and give the domain and range.



10. 10 pts. Decide whether the relation $2x - y < 3$ defines y as a function of x , and give the domain.