



MTH 95 – Ch. 8 Review

Note: On the test, you will be allowed to use your calculators but no notes. You will be expected to show all of your work clearly and simplify all answers. When simplifying radical expressions, you may assume all variables are positive.

1. Evaluate using real numbers, or state that it is not a real number:
  - a.  $\sqrt{64}$
  - b.  $-\sqrt{64}$
  - c.  $\sqrt{-64}$
  - d.  $\sqrt[3]{-64}$
  
2. Find the domain of the following functions. Write your answer in interval notation.
  - a.  $f(x) = \sqrt{x+4}$
  - b.  $g(x) = 3 + \sqrt{6-7x}$
  - c.  $h(x) = \sqrt[3]{1-x}$
  
3. Write in radical form, and simplify, if possible.
  - a.  $16^{1/2}$
  - b.  $27^{1/3}$
  - c.  $8^{2/3}$
  - d.  $(x+1)^{3/4}$
  
4. Use properties of exponents to simplify. Write your answers in simplest radical form. Assume all variables are positive.
  - a.  $(x^{-2/3})^{3/4}$
  - b.  $a^{2/3} \cdot a^{5/4}$
  - c.  $\left(\frac{81x^{16}}{y^8}\right)^{-1/2}$
  - d.  $\frac{\sqrt[3]{4x^4y^2}}{\sqrt{2xy}}$
  
5. Simplify (use absolute values when necessary):
  - a.  $\sqrt{49x^{12}y^4}$
  - b.  $\sqrt{48a^6b^5}$
  - c.  $(\sqrt[5]{a^2b^4})^{15}$
  
  - d.  $\sqrt[3]{4}\sqrt[3]{2}$
  - e.  $\sqrt[3]{4} + \sqrt[3]{2}$
  - f.  $\frac{\sqrt[3]{4}}{\sqrt[3]{2}}$

g.  $\sqrt{50x^{13}y^{15}}$  h.  $\sqrt[3]{48a^6b^5}$  i.  $3\sqrt{2x^5} \cdot 4\sqrt{10x^2}$

j.  $\frac{\sqrt{40xy^3}}{\sqrt{8x}}$  k.  $3\sqrt{45} - 8\sqrt{20} + \sqrt{405}$

l.  $x\sqrt[3]{54x} - \sqrt[3]{2x^4}$  m.  $(\sqrt{3} - \sqrt{2})^2$  n.  $(3\sqrt{7} + 2\sqrt{5})(2\sqrt{7} - 4\sqrt{5})$

6. Rationalize the denominator and simplify.

a.  $\frac{3}{\sqrt{5}}$  b.  $\frac{\sqrt{7}}{\sqrt{12}}$  c.  $\frac{3}{4 - \sqrt{7}}$

7. Solve the radical equation:

a.  $\sqrt{8-x} + 7 = 4$  b.  $3\sqrt{x} + 1 = 6$  c.  $x = \sqrt{x-1} + 3$

d.  $\sqrt{4x-3} = 2 + \sqrt{2x-5}$

8. Simplify. Write your answer in terms of  $i$ .

a.  $\sqrt{-64}$       b.  $\sqrt{-72}$

9. Perform the indicated operation and simplify. Write your answer in standard form  $a+bi$ .

a.  $(5-9i)+(-4+2i)$       b.  $(5-9i)-(-4+2i)$

c.  $(5-9i)(-4+2i)$       d.  $\frac{5-9i}{-4+2i}$

## Answers

1. a. 8                      b. -8                      c. not real                      d. -4
2. a.  $[-4, \infty)$                       b.  $(-\infty, 6/7]$                       c.  $(-\infty, \infty)$
3. a.  $\sqrt{16} = 4$                       b.  $\sqrt[3]{27} = 3$                       c.  $\sqrt[3]{8^2} = 4$                       d.  $\sqrt[4]{(x+1)^3}$
4. a.  $x^{-1/2}$  or  $\frac{1}{\sqrt{x}}$                       b.  $a^{23} = x^{12}\sqrt{x^9}$                       c.  $\frac{y^4}{9x^8}$                       d.  $\sqrt[6]{2x^5y}$
5. a.  $7x^6y^2$                       b.  $4|a^3|b^2\sqrt{3b}$                       c.  $a^6b^{12}$   
d. 2                      e. cannot simplify                      f.  $\sqrt[3]{2}$   
g.  $5x^6|y^7|\sqrt{2xy}$                       h.  $2a^2b\sqrt[3]{6b^2}$                       i.  $24|x^3|\sqrt{5x}$   
j.  $|y|\sqrt{5y}$                       k.  $2\sqrt{5}$   
l.  $2|x^3|\sqrt{2x}$                       m.  $11-2\sqrt{6}$                       n.  $2-8\sqrt{35}$
6. a.  $\frac{3\sqrt{5}}{5}$                       b.  $\frac{\sqrt{21}}{6}$                       c.  $\frac{4+\sqrt{7}}{3}$
7. a.  $\emptyset$                       b.  $x = \frac{25}{9}$                       c.  $x = 5$                       d.  $x = 3, x = 7$
8. a.  $8i$                       b.  $6i\sqrt{2}$
9. a.  $1-7i$                       b.  $9-11i$   
c.  $-2+46i$                       d.  $-\frac{19}{10} + \frac{13}{10}i$