

Graded Homework 10 (see section 10.1)

1. Evaluate:

a.  $\sqrt{9}$       b.  $\sqrt{121}$       c.  $\sqrt[3]{27}$       d.  $\sqrt[3]{-27}$

2. Express in radical notation:

a.  $6^{\frac{1}{2}}$       b.  $8^{\frac{1}{3}}$       c.  $32^{\frac{1}{5}}$       d.  $4^{\frac{3}{2}}$

3. Simplify:

a.  $\sqrt[3]{x^3y^6}$       b.  $(y^4)^{1/2}$       c.  $\sqrt{\frac{y^4}{x^2}}$       d.  $\sqrt{y^3} \cdot \sqrt[3]{y^2}$

4. Use the calculator to find (if possible) the following numbers:

a.  $\sqrt{-7}$       b.  $\sqrt[4]{-56}$       c.  $\sqrt[3]{-7}$       d.  $\sqrt[3]{-56}$

5. Simplify:

a.  $\sqrt{\frac{9}{25}}$       b.  $\sqrt[3]{x} \cdot \sqrt[3]{x^2}$       c.  $\sqrt{\frac{x}{2}} \cdot \sqrt{\frac{x}{8}}$       d.  $\frac{\sqrt{4xy^2}}{\sqrt{x}}$

6. Complete the following equations by filling in the blank:

a.  $\sqrt{500}$  can be broken apart into what number times  $\sqrt{5}$  ?

b.  $\sqrt{28}$  can be broken apart into what number times  $\sqrt{7}$  ?

c.  $\sqrt{200}$  can be broken apart into what number times  $\sqrt{2}$  ?

d.  $\sqrt{5x} \sqrt{5z}$  can be expressed as some number times  $\sqrt{xz}$ . What is that number?

7. Sketch: (see page 661, example 1)

a.  $y = \sqrt{x}$

b.  $y = \sqrt[3]{x}$

8. a. If  $f(x) = x^{\frac{5}{2}}$ , find  $f(4)$ . (see section 10.2)

b. If  $f(x) = x^{\frac{3}{4}}$ , find  $f(16)$ .

c. If  $f(x) = x^{\frac{1}{5}}$ , and  $g(x) = x^{\frac{1}{3}}$  find  $f(g(x))$ .

9. Albert Einstein showed that the weight of an object increases when traveling near the speed of light. If a person's weight on Earth is  $W_0$ , then the same person's weight,  $W$ , in a spaceship traveling at velocity  $v$  is given by:

$W(v) = \frac{W_0}{\sqrt{1 - (\frac{v}{c})^2}}$ . Evaluate the value of  $W$  when  $v = 0.6c$  and  $W_0$  is 220 pounds. This is, find  $W(0.6c)$  and

interpret the result of this calculation.

10. Solve for  $x$  if: (see section 10.6)

a.  $\sqrt{x} = 8$

b.  $\sqrt{3x} = 6$

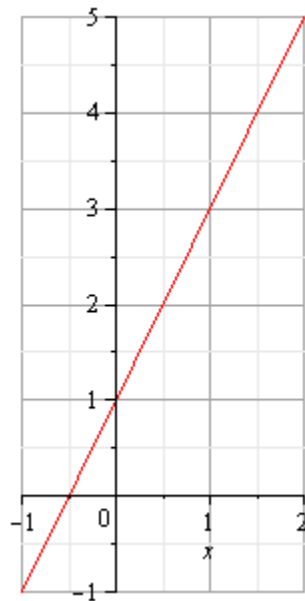
c.  $\sqrt{x^2 - 4} = x - 2$

d.  $\sqrt[3]{x + 5} = 2$

11. a. If  $Z = \sqrt{L^2 + R^2}$  solve the equation for  $R$ .

b. Find the length of the line segment from  $x = 0$  to  $x = 1$  for the line shown in the graph below:

(see page 745 for the distance formula)



12. If a circular highway curve without any banking has a radius of  $R$  feet, the speed limit  $L$  in miles per hour for the curve is given by the equation  $L = 1.5\sqrt{R}$ .

a. Find the speed limit for a curve having a radius of 400 feet.

b. If the radius of the curve doubles, what happens to the speed limit?

c. A curve with a 40 mile per hour speed limit is being designed. What should be its radius?