

Sec. 1.5, 3.1

$r$  is a square root of a number if  $r^2 = s$ .

What is the square root of 25?

$$r = 5 \quad (5^2 = 25) \quad r = -5 \quad ((-5)^2 = 25)$$

$$\sqrt{25} = 5 \quad -\sqrt{25} = -5$$

$$x^2 = 25$$

Properties of Square Root

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b} \quad \text{Ex: } \sqrt{45} = \sqrt{9 \cdot 5} = 3\sqrt{5}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \quad \text{Ex: } \sqrt{\frac{7}{16}} = \frac{\sqrt{7}}{\sqrt{16}} = \frac{\sqrt{7}}{4}$$

Simplify the expression.

a.  $\sqrt{75} = 5\sqrt{3}$        $\sqrt{25 \cdot 3} = 5\sqrt{3}$

$\begin{matrix} \textcircled{5} \uparrow 15 \\ \textcircled{3} \textcircled{5} \end{matrix}$

b.  $\sqrt{1008} = 2 \cdot 2 \cdot 3 \sqrt{7} = 12\sqrt{7}$

$\begin{matrix} \textcircled{2} \uparrow 504 \\ \textcircled{3} \uparrow 252 \\ \textcircled{2} \uparrow 126 \\ \textcircled{2} \uparrow 63 \\ \textcircled{7} \uparrow 9 \\ \textcircled{3} \textcircled{3} \end{matrix}$

c.  $\sqrt{7} \cdot \sqrt{35}$   
 $\sqrt{7 \cdot 35} = 7\sqrt{5}$   
 (7) (5) (7)

d.  $\sqrt{8} \cdot \sqrt{28}$       $2 \cdot 2 \sqrt{2 \cdot 7}$   
 $4\sqrt{2} \cdot 2\sqrt{7}$       $4\sqrt{14}$   
 (4) (2)     (4) (7)

e.  $\sqrt{\frac{100}{169}} = \frac{\sqrt{100}}{\sqrt{169}} = \frac{10}{13}$

f.  $\sqrt{\frac{11}{144}} = \frac{\sqrt{11}}{\sqrt{144}} = \frac{\sqrt{11}}{12}$

g.  $\sqrt{\frac{2}{15}} = \frac{\sqrt{2}}{\sqrt{15}}$   
 $\frac{\sqrt{2}}{\sqrt{15}} \cdot \frac{\sqrt{15}}{\sqrt{15}} = \frac{\sqrt{30}}{15}$

\* Simplify:  
 no radicals  
 in denominator

p. 35 (3-14)  
 all

h.  $\sqrt{\frac{5}{2}}$   
 $\frac{\sqrt{5}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{10}}{2}$