

Find exact value ① $\sqrt{49}$

② $-\sqrt{49}$

③ $\sqrt{\frac{81}{16}}$

4.5 Solve Quadratics by Square Roots

5 is the square root of 25 because $(5)^2 = 25$

-5 is too, because $(-5)^2 = 25$

For $\sqrt{25}$, $-\sqrt{25}$ is called a radical

$\sqrt{\quad}$ is the radical sign

25 is the radicand

Note:

$$\sqrt{9} = 3 \text{ (because } 3 \cdot 3 = 9\text{)}$$

$\sqrt{36} = 6$ or another way to think of it

$$36 = 4 \cdot 9$$

$$\sqrt{4 \cdot 9} = \sqrt{4} \cdot \sqrt{9} = 2 \cdot 3 = 6$$

$$1^2 = 1$$

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$7^2 = 49$$

$$8^2 = 64$$

$$9^2 = 81$$

$$10^2 = 100$$

$$11^2 = 121$$

$$12^2 = 144$$

$$13^2 = 169$$

$$14^2 = 196$$

$$15^2 = 225$$

Can break up into factors

Product Property of Factors

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b} \text{ or}$$

$$\sqrt{\text{product}} = \sqrt{\text{factor}} \cdot \sqrt{\text{factor}}$$

} Will use this to simplify
Square roots

Simplify Using Perfect Squares

① $\sqrt{75}$
25 divides into 75
25 · 3

② $\sqrt{35}$
5 · 7 ≠ not perfect squares

$$\sqrt{25} \cdot \sqrt{3}$$

$$\sqrt{35}$$

$\sqrt{\text{perfect } \square} \cdot \sqrt{\text{left over junk}}$

$$5\sqrt{3}$$

$$\textcircled{3} \sqrt{80}$$

$$16 \cdot 5$$

$$\sqrt{16} \cdot \sqrt{5}$$

$$\textcircled{4\sqrt{5}}$$

$$\textcircled{4} \sqrt{27}$$

$$9 \cdot 3$$

$$\sqrt{9} \cdot \sqrt{3}$$

$$\textcircled{3\sqrt{3}}$$

$$\textcircled{5} \sqrt{98}$$

$$49 \cdot 2$$

$$\sqrt{49} \cdot \sqrt{2}$$

$$\textcircled{7\sqrt{2}}$$

$$\textcircled{6} \sqrt{6} \cdot \sqrt{21}$$

* Multiply together

$$= \sqrt{126}$$

$$9 \cdot 14$$

$$\sqrt{9} \cdot \sqrt{14}$$

$$\textcircled{3\sqrt{14}}$$

$$\textcircled{7} 3\sqrt{10} \cdot \sqrt{5}$$

$$= 3\sqrt{50}$$

$$25 \cdot 2$$

$$3\sqrt{25} \cdot \sqrt{2}$$

$$3 \cdot 5 \sqrt{2}$$

$$\textcircled{15\sqrt{2}}$$

p269: 1, 3-8 - on board p266 #3,4

p269
1) In $\sqrt{72}$, what is 72 called?

$$3)\sqrt{28}$$

$$4)\sqrt{92}$$

$$5)\sqrt{150}$$

$$6)\sqrt{3} \cdot \sqrt{27}$$

$$7) 4\sqrt{6} \cdot \sqrt{6}$$

$$8) 5\sqrt{24} \cdot 3\sqrt{10}$$

p266
3) $\sqrt{10} \cdot \sqrt{15}$

$$4) 2\sqrt{8} \cdot 3\sqrt{28}$$