

Geometry  
Guided Notes  
Square Roots

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_

1. The product of a number and itself is called a perfect square. What number multiplied by itself will give you the following numbers?

a.  $\underline{1} \times \underline{1} = 1$

h.  $\underline{8} \times \underline{8} = 64$

b.  $\underline{2} \times \underline{2} = 4$

i.  $\underline{9} \times \underline{9} = 81$

c.  $\underline{3} \times \underline{3} = 9$

j.  $\underline{10} \times \underline{10} = 100$

d.  $\underline{4} \times \underline{4} = 16$

k.  $\underline{11} \times \underline{11} = 121$

e.  $\underline{5} \times \underline{5} = 25$

l.  $\underline{12} \times \underline{12} = 144$

f.  $\underline{6} \times \underline{6} = 36$

m.  $\underline{13} \times \underline{13} = 169$

g.  $\underline{7} \times \underline{7} = 49$

n.  $\underline{14} \times \underline{14} = 196$

perfect square

ex: 4, 9, 16

2. Find the perfect square factor for each of the following numbers.

a. 40  $\boxed{4} \cdot 10$

b. 75  $\boxed{25} \cdot 3$

c. 128  $\boxed{64} \cdot 2$

d. 20  $\boxed{4} \cdot 5$

e. 147  $\boxed{49} \cdot 3$

f. 243  $\boxed{81} \cdot 3$

g. 242  $\boxed{121} \cdot 2$

h. 27  $\boxed{9} \cdot 3$

i. 8  $\boxed{4} \cdot 2$

j. 32  $\boxed{16} \cdot 2$

$\boxed{4} \cdot 8$

perfect square goes into

3. What is the square root?

a.  $\sqrt{9} = \underline{3}$

d.  $\sqrt{121} = \underline{11}$

g.  $\sqrt{144} = \underline{12}$

j.  $\sqrt{225} = \underline{15}$

m.  $\sqrt{25} = \underline{5}$

b.  $\sqrt{36} = \underline{6}$

e.  $\sqrt{4} = \underline{2}$

h.  $\sqrt{100} = \underline{10}$

k.  $\sqrt{49} = \underline{7}$

n.  $\sqrt{196} = \underline{14}$

c.  $\sqrt{169} = \underline{13}$

f.  $\sqrt{64} = \underline{8}$

i.  $\sqrt{81} = \underline{9}$

l.  $\sqrt{16} = \underline{4}$

Ask yourself:  
 what is the largest  
 perfect square that goes  
 into the number?

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4. Write the radical expression in simplest form.

Example:  $\sqrt{605} = \sqrt{121 \cdot 5} = \sqrt{121} \cdot \sqrt{5} = 11 \cdot \sqrt{5} = 11\sqrt{5}$

a.  $\sqrt{40} = \sqrt{4 \cdot 10}$

$= \sqrt{4} \sqrt{10}$

$= 2\sqrt{10}$

b.  $\sqrt{75} = \sqrt{25 \cdot 3}$

$= \sqrt{25} \sqrt{3}$

$= 5\sqrt{3}$

c.  $\sqrt{27} = \sqrt{9 \cdot 3}$

$= \sqrt{9} \sqrt{3}$

$= 3\sqrt{3}$

d.  $\sqrt{243} = \sqrt{81 \cdot 3}$

$= \sqrt{81} \sqrt{3}$

$= 9\sqrt{3}$

5. Write the radical expression in simplest form.

Example:  $2\sqrt{75} = 2\sqrt{25 \cdot 3} = 2\sqrt{25} \cdot \sqrt{3} = 2 \cdot 5 \cdot \sqrt{3} = 10\sqrt{3}$

a.  $-\sqrt{300} = -\sqrt{100 \cdot 3}$

$= -\sqrt{100} \sqrt{3}$

$= -10\sqrt{3}$

b.  $3\sqrt{20} = 3\sqrt{4 \cdot 5}$

$= 3\sqrt{4} \sqrt{5}$

$= 3 \cdot 2 \sqrt{5} = 6\sqrt{5}$

c.  $-6\sqrt{28} = -6\sqrt{4 \cdot 7}$

$= -6\sqrt{4} \sqrt{7}$

$= -6 \cdot 2 \sqrt{7} = -12\sqrt{7}$

d.  $10\sqrt{242} = 10\sqrt{121 \cdot 2}$

$= 10\sqrt{121} \sqrt{2}$

$= 10 \cdot 11 \sqrt{2}$

$= 110\sqrt{2}$

More Examples

$\sqrt{72} = \sqrt{9 \cdot 8}$

$= \sqrt{9} \sqrt{8}$

$= 3\sqrt{8}$

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

$= 3\sqrt{4} \sqrt{2}$

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

$= 6\sqrt{2}$

$\sqrt{45} = \sqrt{9 \cdot 5}$

$= \sqrt{9} \sqrt{5}$

$= 3\sqrt{5}$