Warm Up Grade 8

Date: Nov. 13



Use product of perfect squares to find the square root of the following:

(a) 2304

$\sqrt{2304}$

$= \sqrt{144 \times 16}$

$= \sqrt{144} \times \sqrt{16}$ ①

$= 12 \times 4$ ①

$\sqrt{2304} = 48$ ①

(b) $\sqrt{2916}$

$= \sqrt{81} \times \sqrt{36}$ ①

$= 9 \times 6$ ①

$\sqrt{2916} = 54$ ①

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

on test

$\sqrt{169^2} = 169$

$\sqrt{169} \times \sqrt{169}$

13×13

169

Sep 16-10:41 AM

Square 25 $\Rightarrow 25^2 = 625$

Square root 16 $\sqrt{16} = 4$

Warm Up Grade 8

Date:_____



Use product of perfect squares to find the square root of the following:

(a) 2304 (b) 2916

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

$\sqrt{2304}$

$= \sqrt{144 \times 16}$

$= \sqrt{144} \times \sqrt{16}$

$= 12 \times 4$

$\sqrt{2304} = 48$

b) $\sqrt{2916}$

$= \sqrt{81 \times 36}$

$= \sqrt{81} \times \sqrt{36}$

$= 9 \times 6$

$\sqrt{2916} = 54$

Sep 16-10:41 AM

Warm Up Grade 8
HW solutions
solutions

Use product of perfect squares to find the square root of the following:

(a) 5184 (b) 5929 (c) 7056

(d) 1089 (e) 576 (f) 11 025

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

a) $\sqrt{5184} = \sqrt{144 \times 36}$

$= \sqrt{144} \times \sqrt{36}$

$= 12 \times 6$

$= 72$

$\sqrt{5184} = 72$

b) $\sqrt{5929} = \sqrt{121 \times 49}$

$= \sqrt{121} \times \sqrt{49}$

$= 11 \times 7$

$= 77$

c) $\sqrt{7056} = \sqrt{196 \times 36}$

$= \sqrt{196} \times \sqrt{36}$

$= 14 \times 6$

$= 84$

d) $\sqrt{1089} = \sqrt{121 \times 9}$

$= \sqrt{121} \times \sqrt{9}$

$= 11 \times 3$

$= 33$

e) $\sqrt{576} = \sqrt{36 \times 16}$

$= \sqrt{36} \times \sqrt{16}$

$= 6 \times 4$

$= 24$

f) $\sqrt{11025} = \sqrt{225 \times 49}$

$= \sqrt{225} \times \sqrt{49}$

$= 15 \times 7$

$= 105$

$\sqrt{576} = \sqrt{144 \times 4}$

$= \sqrt{144} \times \sqrt{4}$

$= 12 \times 2$

$= 24$

Sep 16-10:41 AM

Homework Solutions

Homework pg. 16 # 12 -15

12. 96

i) 1x96
2x48
3x32
4x24
6x16
8x12
not square

ii) 484
1x484
2x242
4x121
11x44
22x22
perfect square
odd number of factors

iii) 240
1x240
2x120
3x80
4x60
5x48
6x40
8x30
10x24
12x20
15x16
not a square

iv) 152
1x152
2x76
4x38
8x19
not a square

v) 441
1x441
3x147
7x63
9x49
21x21
perfect square

vi) 54
1x54
2x27
3x18
6x9
not a square

Sep 15-10:54 AM

Homework Solutions

13 a) $\sqrt{1} = 1$

b) $\sqrt{49} = 7$

c) $\sqrt{144} = 12$

d) $\sqrt{9} = 3$

e) $\sqrt{16} = 4$

f) $\sqrt{100} = 10$

g) $\sqrt{625} = 25$

h) $\sqrt{225} = 15$

14 a) $3^2 = 9$

$\sqrt{9} = 3$

b) $6^2 = 36$

$\sqrt{36} = 6$

c) $10^2 = 100$

$\sqrt{100} = 10$

d) $\sqrt{117^2} = 117$

15. $\sqrt{4} = 2$

b) $\sqrt{121} = 11$

c) $\sqrt{225} =$

$15 \times 15 = 225$

so $\sqrt{225} = 15$

d) $\sqrt{676}$

$\sqrt{26 \times 26}$

26

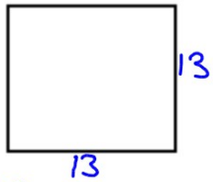
Perfect Squares	
1	81
4	100
9	121
16	144
25	169
36	196
49	225
64	

Sep 15-11:01 AM

Homework pg. 16 # 16- 19

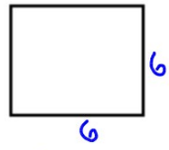
Homework Solutions

16. a) $\sqrt{169} = 13$



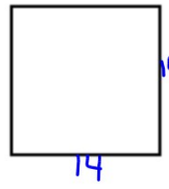
$169 = 13 \times 13$

b) $\sqrt{36} = 6$



$36 = 6 \times 6$

c) $\sqrt{196} = 14$



$196 = 14 \times 14$

17 $\sqrt{\quad} = 23$

$\sqrt{23^2} = 23$ $\sqrt{529} = 23$

18. $3^2 = 9$ $\sqrt{9} = 3$

The answer of 3^2 is 9, and the answer of $\sqrt{9}$ is 3, so this show that taking the square root is the inverse of squaring a number.

19. a) $\sqrt{36}, 36, 4, \sqrt{9}$

$6, 36, 4, 3$

Least → Greatest $\sqrt{9}, 4, \sqrt{36}, 36$

b) $\sqrt{400}, \sqrt{100}, 19, 15$

$20, 10$

→ $\sqrt{100}, 15, 19, \sqrt{400}$

c) $\sqrt{81}, 81, \sqrt{100}, 11$

$9 \quad 10$

→ $\sqrt{81}, \sqrt{100}, 11, 81$

d) $\sqrt{49}, \sqrt{64}, \sqrt{36}, 9$

$7, 8, 6, 9$

→ $\sqrt{36}, \sqrt{49}, \sqrt{64}, 9$

Sep 15-1:00 PM

Prime numbers are numbers that are only divisible by 1 and itself

2, 3, 5, 7, 11, 13, 17, 19, 23, 29,...

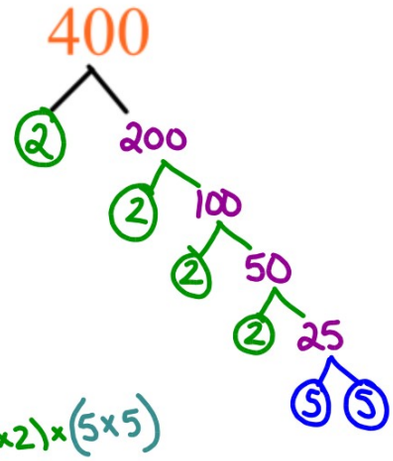
Sep 12-1:42 PM

(Tree)

Finding the square root using prime factorization

To find the square root of number using prime factorization, you first have to write the number as a product of prime numbers. You can use a factor tree to write a number as a product of prime numbers.

Step 1) Find the prime Factors of 400



$400 = (2\times2)\times(2\times2)\times(5\times5)$

put in pairs

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

Step 2) Find the square root by putting the factors in pairs, under a √ , then calculate.

$\sqrt{400} = \sqrt{(2\times2)\times(2\times2)\times(5\times5)}$ pairs

$\sqrt{400} = \sqrt{(2\times2)}\times\sqrt{(2\times2)}\times\sqrt{(5\times5)}$ separate

calculate the √ of each pair remember the $\sqrt{2\times2} = \sqrt{4} = 2$

$\sqrt{400} = 2 \times 2 \times 5$

$\sqrt{400} = 20$

Prime Numbers
2, 3, 5, 7, 11, 13, 17, 19, 23, 29

Sep 16-10:05 AM

Now find the $\sqrt{324}$, using each method below:
(a)product of perfect squares
(b)prime factorization
(c) Factors

Solutions

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

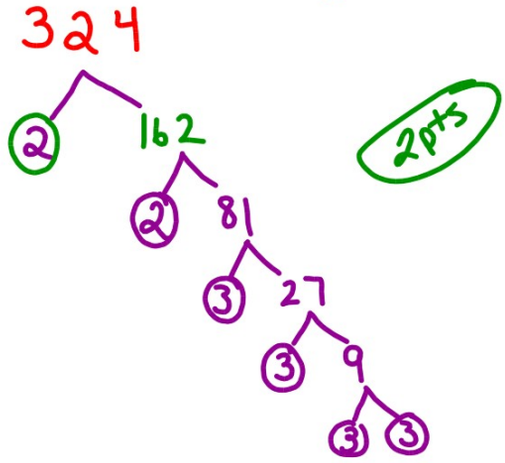
a) product of perfect squares Yesterday

$\sqrt{324} = \sqrt{81} \times \sqrt{4}$

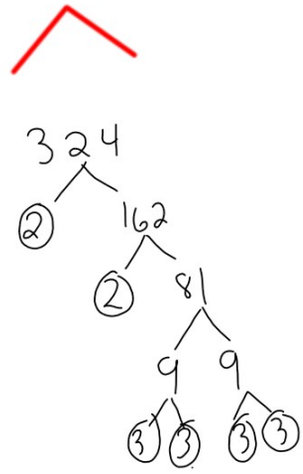
$= 9 \times 2$

$\sqrt{324} = 18$

b) prime factorization Today



Some may do this



c) Factors

324

$2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 3$

$\sqrt{324} = \sqrt{2 \cdot 2} \times \sqrt{3 \cdot 3} \times \sqrt{3 \cdot 3}$ (1)

$= 2 \times 3 \times 3$ (1)

$\sqrt{324} = 18$ (1)

$324 =$

Now find the $\sqrt{324}$, using each method below:
(a)product of perfect squares
(b)prime factorization
(c) Factors

Solutions

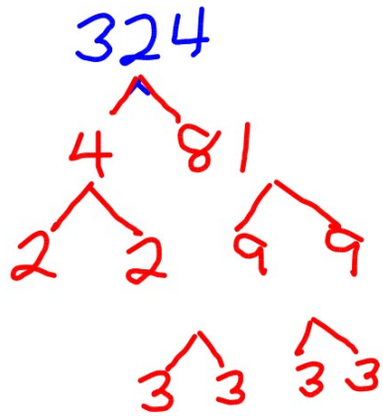
Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

a) Product of Perfect Squares

$\sqrt{324} = \sqrt{4 \times 81}$
$= \sqrt{4} \times \sqrt{81}$
$= 2 \times 9$
$= 18$

b) Prime Factorization

$324 = 2 \times 2 \times 3 \times 3 \times 3 \times 3$
$\sqrt{324} = \sqrt{(2 \times 2) \times (3 \times 3) \times (3 \times 3)}$
$= 2 \times 3 \times 3$
$= 18$



c) Find the factor

Factors
1, 2, 3, 4, 6, 9, 12, 18, 27, 36
54, 81, 108, 162, 324

Odd number of factors, so 324 is a perfect square, Middle number is 18
so $\sqrt{324} = 18$

324
1 x 324
2 x 162
3 x 108
4 x 81
6 x 54
9 x 36
12 x 27
18 x 18

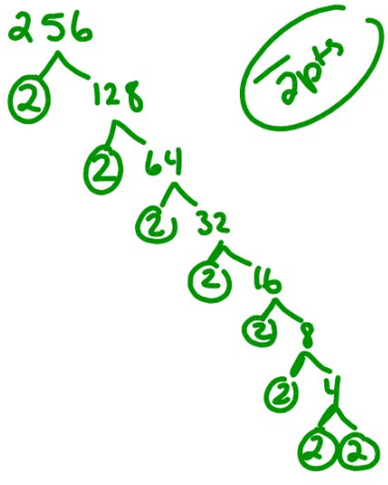
Now find the $\sqrt{256}$, using each method below:
(a)product of perfect squares Yesterday
(b)prime factorization Today

A

$\sqrt{256} = \sqrt{64} \times \sqrt{4}$
$= 8 \times 2$
$\sqrt{256} = 16$

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

B



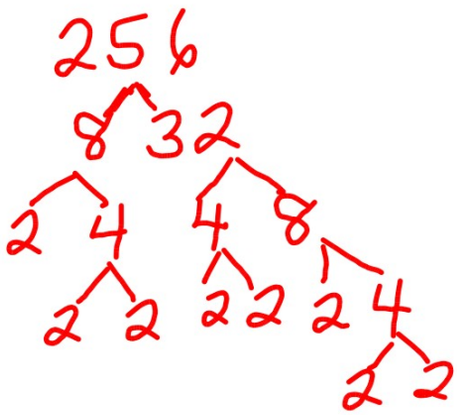
$\sqrt{256} = \underbrace{\sqrt{2\cdot2}}_{\sqrt{4}} \times \sqrt{2\cdot2} \times \sqrt{2\cdot2} \times \sqrt{2\cdot2}$ (1 pts)

(1 pt)

$= 2 \times 2 \times 2 \times 2$

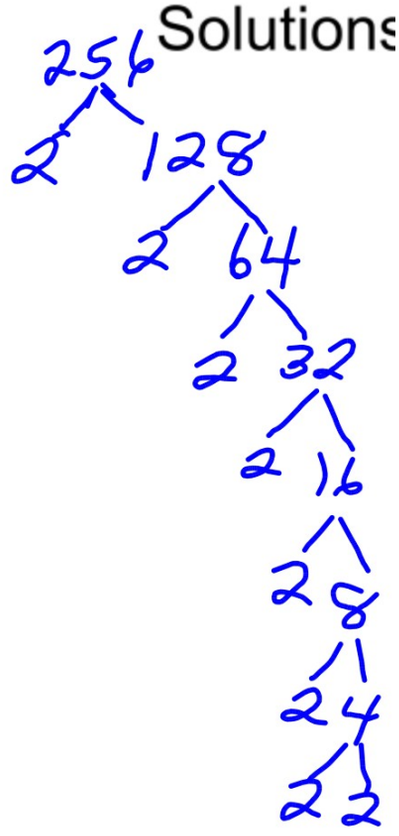
$\sqrt{256} = 16$ (1pt)

Find the square root of 256 using prime factorization



OR

Solutions



$256 = 2\times2\times2\times2\times2\times2\times2\times2$

$\sqrt{256} = \sqrt{(2\times2)(2\times2)(2\times2)(2\times2)}$

$= 2 \times 2 \times 2 \times 2$

$= 16$

b) Find the square root of 256 using product of squares

$\sqrt{256} = \sqrt{4 \times 64}$

$= \sqrt{4} \times \sqrt{64}$

$= 2 \times 8$

$= 16$

Product of Perfect Squares

Sep 16-8:45 AM