

Warm Up Grade 8

Date: Nov 12



1) Find the square (x^2) of each number below:

a) 9 $9^2 = 81$

b) 16 $16^2 = 256$

2) Find the square root ($\sqrt{\ }$) of each number below:

a) 25 $\sqrt{25} = 5$

b) 100 $\sqrt{100} = 10$

3) The factors of 624 are:

1,2,3,4,6,8,12,13,16,24,26,39,48,52,78,104,156,208,312,624

Is 624 perfect? How do you know

624 → has 20 factor
↳ even # of factors
then 624 is NOT
a perfect Square #

Homework Solutions

Pg 15

5 a) $4^2 = 16$

b) $6^2 = 36$

c) $2^2 = 4$

d) $9^2 = 81$

6 a) $8^2 = 64$

b) $3^2 = 9$

c) $1^2 = 1$

d) $7^2 = 49$

7 a) $\sqrt{25} = 5$

b) $\sqrt{81} = 9$

c) $\sqrt{64} = 8$

d) $\sqrt{169} = 13$

8 a) $1^2 = 1$

$10^2 = 100$

$100^2 = 10\,000$

$1000^2 = 1\,000\,000$

b) $10\,000^2 = 100\,000\,000$

$1\,000\,000^2 = 1\,000\,000\,000\,000$

9a) 50

1x50
2x25
5x10

not perfect square

ii) 100

1x100
2x50
4x25
5x20
10x10

perfect square

(b) $\sqrt{100} = 10$

iii) 144

1x144
2x72
3x48
4x36
6x24
8x18
9x16
12x12

perfect square

(b) $\sqrt{144} = 12$

iv) 85

1x85
5x17

not perfect square

10 a) 256

1 x 256
2 x 128
4 x 64
8 x 32
16 x 16

1, 2, 4, 8, (16), 32, 64, 128, 256

$\sqrt{256} = 16$

b) 625

1 x 625
5 x 125
25 x 25

1, 5, (25), 125, 625

$\sqrt{625} = 25$

c) 121

1 x 121
11 x 11

1, (11), 121

$\sqrt{121} = 11$

11 a) 225 - odd number of factor, so perfect square

$\sqrt{225} = 15$ (middle factor)

b) 500 → even number of factors not a square number

c) 324 - odd number of factors, perfect square

$\sqrt{324} = 18$

d) 160 - even factors, not a square

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

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	

Section 1.2
continued

Other Ways of Finding Square Roots



* If you know a number is a perfect square it is easy find the square root, whatever number you multiply by itself to get the square root is the answer.

Ex. $5 \times 5 = 25$ so $\sqrt{25} = 5$

* You can also find the square root of a number by listing the factors. If a number has an odd number of factors, it is a perfect square and the middle factor is the square root.

Ex. 225 - 1, 3, 5, 9, 15, 25, 45, 75, 225
225 has 9 factors so it is a perfect square.
$\sqrt{225}$ is the middle factor or 15

* Finding the square root using the product of perfect squares

$$\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$$

$\sqrt{900} = \sqrt{225 \times 4}$

$= \sqrt{225} \times \sqrt{4}$

$= 15 \times 2$

$\sqrt{900} = 30$

$\sqrt{1764} = \sqrt{196 \times 9}$

$= \sqrt{196} \times \sqrt{9}$

$= 14 \times 3$

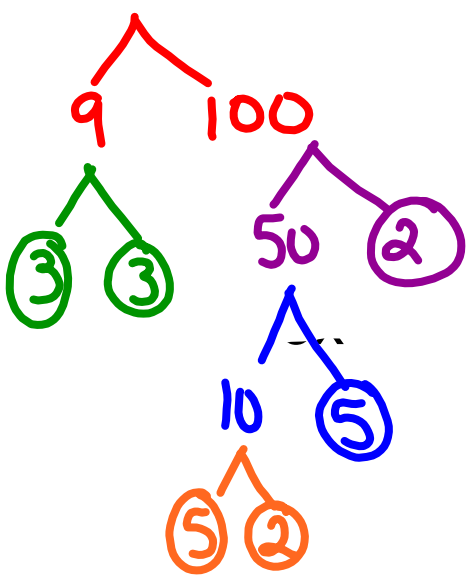
$\sqrt{1764} = 42$

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

Factor Tree

Prime 2, 3, 5, 7, 11, 13, 17, 19...

900



$900 = 2 \times 2 \times 3 \times 3 \times 5 \times 5$

$\sqrt{900} = \sqrt{(2\times2) \times (3\times3) \times (5\times5)}$

$\sqrt{900} = \sqrt{(2\times2)} \times \sqrt{(3\times3)} \times \sqrt{(5\times5)}$

$\sqrt{900} = 2 \times 3 \times 5$

$\sqrt{900} = 30$

To find the square root of a number using product of perfect squares, you first have to **find 2 perfect squares** that multiply to give the number. Then find the square root of each and multiply the answers.
Remember You need to find TWO PERFECT SQUARES.

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

Using product of perfect square, find the square root of the following:

$\sqrt{}$(a) 1024 $\sqrt{}$(b) 3025 $\sqrt{}$(c) 18 225

$\sqrt{}$(d) 1521 $\sqrt{}$(e) 3969 $\sqrt{}$(f) 6084

a) $\sqrt{1024} = \sqrt{64 \times 16}$

$= \sqrt{64} \times \sqrt{16}$

$= 8 \times 4$

$= 32$

b) $\sqrt{3025} =$

$=$

$=$

$=$

c) $\sqrt{18225} =$

d) $\sqrt{1521} =$

$-$

To find the square root of a number using product of perfect squares, you first have to **find 2 perfect squares** that multiply to give the number. Then find the square root of each and multiply the answers.
Remember You need to find TWO PERFECT SQUARES.

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

Using product of perfect square, find the square root of the following:

$\sqrt{}$(a) 1024 $\sqrt{}$(b) 3025 $\sqrt{}$(c) 18 225

$\sqrt{}$(d) 1521 $\sqrt{}$(e) 3969 $\sqrt{}$(f) 6084

a) $\sqrt{1024} = \sqrt{64 \times 16}$

$= \sqrt{64} \times \sqrt{16}$

$= 8 \times 4$

$= 32$

b) $\sqrt{3025} = \sqrt{121 \times 25}$

$= \sqrt{121} \times \sqrt{25}$

$= 11 \times 5$

$= 55$

c) $\sqrt{18225} = \sqrt{225 \times 81}$

$= \sqrt{225} \times \sqrt{81}$

$= 15 \times 9$

$= 135$

d) $\sqrt{1521}$

$= \sqrt{169 \times 9}$

$= \sqrt{169} \times \sqrt{9}$

$= 13 \times 3$

$= 39$

WS

Using product of perfect square, find the square root of the following:

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

(d) 1089 (e) 576 (f) 11025

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

a) $\sqrt{5184} = \sqrt{\#} \times \sqrt{}$ ← 2 # in list

$= \sqrt{} \times \sqrt{}$

$= \times $

$=$

Homework Board Question

pg.16 # 16, 17, 19