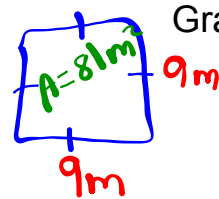




Warm Up
Nov. 3, 2016



Grade 8

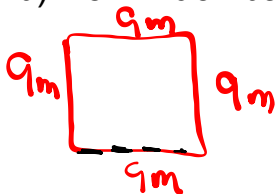
A square room has area of 81 m^2

a) Find the length of a side of the room

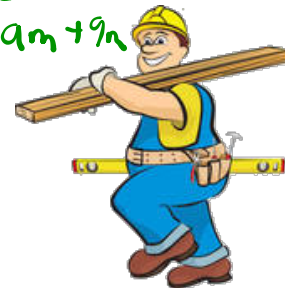
$$\text{Side} = 9 \text{ m}$$

show work

b) How much base board is needed to go around the whole room?



$$\begin{aligned} \text{Perimeter} &= \text{side} + \text{side} + \text{side} + \text{side} \\ &= 9 \text{ m} + 9 \text{ m} + 9 \text{ m} + 9 \text{ m} \\ &= 36 \text{ m} \end{aligned}$$



c) Each piece of baseboard is 1.5 m long. How many pieces of baseboard are needed

$$36 \text{ m} \div 1.5 = 24$$

Need 24 pieces of baseboard



Solution Warm Up
Oct. 27, 2014

Grade 8

A square room has area of 81 m²

a) Find the length of a side of the room

$$\begin{aligned} \text{Area} &= 81 \text{ m}^2 \\ &= 9 \times 9 \\ \text{Side} &= 9\text{m} \end{aligned}$$

b) How much base board is needed to go around the whole room?

$$\begin{aligned} P &= 9 \text{ m} + 9 \text{ m} + 9 \text{ m} + 9 \text{ m} \\ &= 36 \text{ m} \end{aligned}$$



c) Each piece of baseboard is 1.5 m long. How many pieces of baseboard are needed

pieces		
1.5 m x 10 = 15 m	} up by 15	1.5m x 24 = 36
1.5 m x 20 = 30 m		1.5m x 25 = 37.5
1.5 m x 30 = 45 m		1.5m x 26 = 39

Handwritten notes: 'up by 10' with an arrow pointing from 10 to 20; 'up by 15' with an arrow pointing from 15 to 30; 'up by 15' with an arrow pointing from 30 to 45.

or

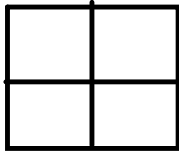
$$\begin{array}{r} 24 \\ 1.5 \overline{)36} \\ \underline{30} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

long division


Need 24 pieces

pg 8

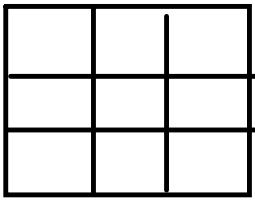
4 a)



$$2 \times 2 = 4 \text{ square units}$$

b)  $1 \times 1 = 1 \text{ square unit}$

c)



$$3 \times 3 = 9 \text{ square units}$$

5 a) $A = l \times w$
 $= 8 \times 8$
 $= 64 \text{ units}^2$

b) $A = l \times w$
 $= 10 \times 10$
 $= 100 \text{ units}^2$

c) $A = l \times w$
 $= 3 \times 3$
 $= 9 \text{ units}^2$

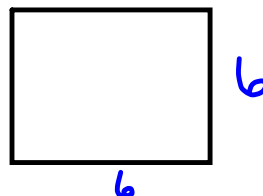
b. Area
36

Length

Width

1	36
2	18
3	12
4	9
6	6

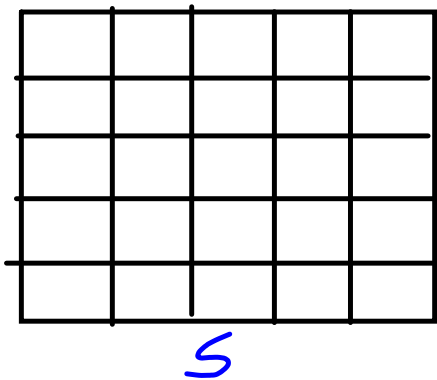
Yes, 36 is a perfect square
 $6 \times 6 = 36$



7. Area	Length	Width
28	1	28
	2	14
	4	7

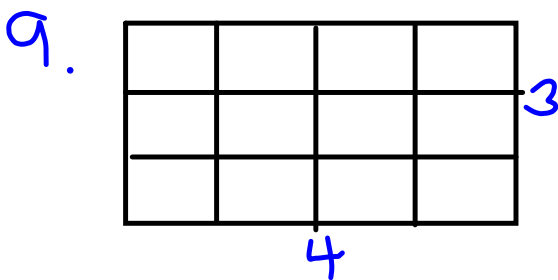
No 28 is not a perfect square, there is no number that you can multiply twice (by itself) to get 28.

8. 25 - Perfect Square



$$5 \times 5 = 25$$

25 is a perfect square that has a side length of 5.



Not a square, the sides are not the same.

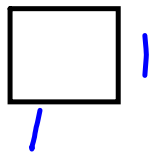
No factors the same

$$\begin{array}{l} 1 \times 12 \\ 2 \times 6 \\ 3 \times 4 \end{array}$$

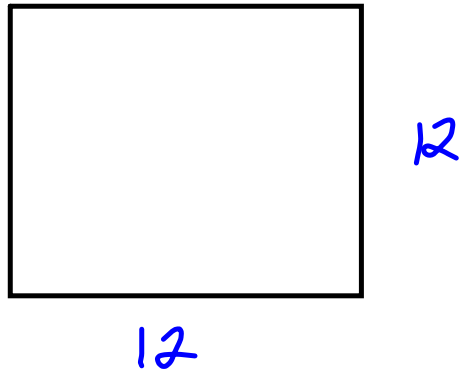
$$\begin{array}{l} 3 \times 3 = 9 \\ 4 \times 4 = 16 \end{array}$$

No whole numbers that multiply by itself will give 12.

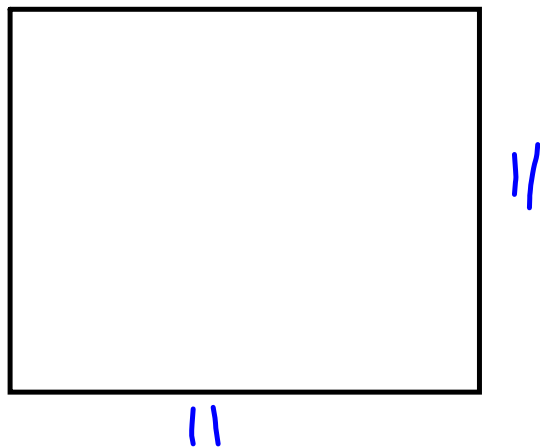
10. a) 1



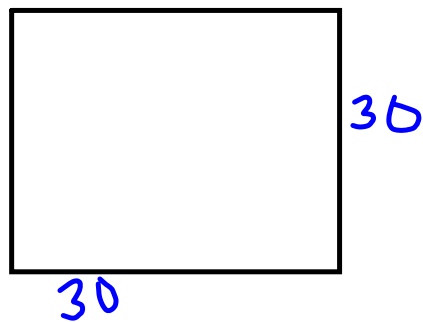
b) 144



c) 121



d) 900



$$11 \text{ Area} = 100 \text{ m}^2$$



$$10 \times 10 = 100$$

so side length
= 10m

$$b) \text{ Area} = 64 \text{ cm}^2$$

$$8 \times 8 = 64$$

so side length = 8cm

$$c) \text{ Area} = 81 \text{ m}^2$$

$$9 \times 9 = 81$$

so side length = 9m

$$d) \text{ Area} = 400 \text{ cm}^2$$

$$20 \times 20 = 400$$

so side length = 20cm.

12a) 10 → not perfect square
 $3 \times 3 = 9$, $4 \times 4 = 16$

b) 50 → not perfect square
 there is no number that you
 can multiply by itself to get 50.

c) 81 - Perfect Square
 $9 \times 9 = 81$

d) 20 - not a perfect square
 $4 \times 4 = 16$ $5 \times 5 = 25$

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

↑
12

Write out the factors for each number below

x 1	1						
2	1	2					
3	1	3					
x 4	1	2	4				
5	1	5					
6	1	2	3	6			
7	1	7					
8	1	2	4	8			
x 9	1	3	9				
10	1	2	5	10			
11	1	11					
12	1	2	3	4	6	12	
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

3

$$1 \times 3$$

Factors 1, 3

4

$$1 \times 4$$

$$2 \times 2$$

Factors
1, 2, 4

5

$$1 \times 5$$

Factor
1, 5

6

$$1 \times 6$$

$$2 \times 3$$

Fact
1, 2, 3, 6

7

$$1 \times 7$$

Factor 1, 7

8

$$1 \times 8$$

$$2 \times 4$$

Factor
1, 2, 4, 8

9

$$1 \times 9$$

$$3 \times 3$$

Factors
1, 3, 9

Discuss Factors, have students complete factor sheet 1- 30

1	1							
2	1	2						
3	1	3						
4	1	2	4					
5	1	5						
6	1	2	3	6				
7	1	7						
8	1	2	4	8				
9	1	3	9					
10	1	2	5	10				
11	1	11						
12	1	2	3	4	6	12		
13	1	13						
14	1	2	7	14				
15	1	3	5	15				
16	1	2	4	8	16			
17	1	17						
18	1	2	3	6	9	18		
19	1	19						
20	1	2	4	5	10	20		
21	1	3	7	21				
22	1	2	11	22				
23	1	23						
24	1	2	3	4	6	8	12	24
25	1	5	25					
26	1	2	13	26				
27	1	3	9	27				
28	1	2	4	7	14	28		
29	1	29						
30	1	2	3	5	6	10	15	30

Discuss a number having an odd number of factors.

Any number with an odd number of factors will be a perfect square.

Section 1.2

Squares and Square Roots



Discuss a number having an odd number of factors.

* Any number with an odd number of factors will be a perfect square.

Study

Even number of factors means number is Not perfect

Ex) The factors of 136 are listed below:

1, 2, 4, 8, 17, 34, 68, 136

8 factors

Is 136 a square number? How do you know?

136 has 8 factors which is an even number of factors So Not a perfect square

136

224

1×224
 2×112
 4×56
 7×32
 8×28
 14×16

Factors

$1, 2, 4, 7, 8, 14, 16, 28, 32,$
 $56, 112, 224$

12 factors
even

So 224 Not a perfect
square number

(Perfect square)

Square number: a PRODUCT of a number multiplied by itself

25 is a square number since $5 \times 5 = 25$

area of the square

Square root: a number that when it is multiplied by itself produces a perfect square

$\sqrt{\quad}$ - This is the symbol for square root.

6 is the square root of 36

$$\sqrt{36} = 6$$

side length

$$\text{Area} = \text{side}^2$$

$$\text{Side} = \sqrt{(\text{Area})}$$

Perfect Squares

x^2

\square^2

← perfect square button

\wedge

x^y

← whe exponent is "2"

Square Root



$\sqrt{x^2}$

$$\sqrt{49} = 7$$

Square Roots - $\sqrt{\quad}$

Draw a square with the following little squares inside it:

(a) 36

(b) 9

(c) 4

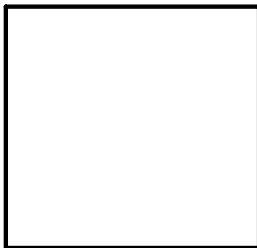
(d) 64



36 is ^(Area) perfect square number
 $\underline{6 \times 6 = 36}$
 so side length = 6
 I can also say
 $\sqrt{36} = 6$



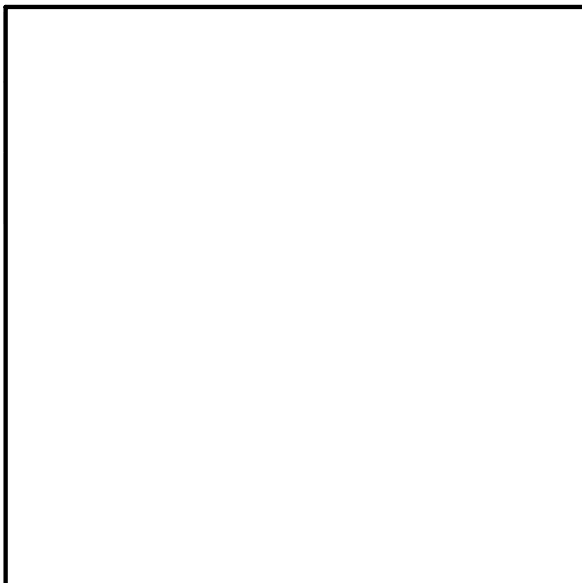
9 is a perfect square
 $\underline{3 \times 3 = 9}$
Side length = 3
 so $\sqrt{9} = 3$

4 is a perfect square

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

side length = 2

So $\sqrt{4} = 2$

64 is a perfect square

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

side length = 8

so $\sqrt{64} = 8$

Class/Homework

page. 14



5
6(a,b, ~~cd~~),
7(a,b, ~~cd~~),
8(a, ~~b~~),
10(a,b, ~~o~~),

11(a,b),
12(i), (~~ii~~), (~~iii~~),
14, ~~ab~~
15 ~~cd~~ →

Study

$$\sqrt{x^2} = x$$

6a) $8^2 = 64$

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

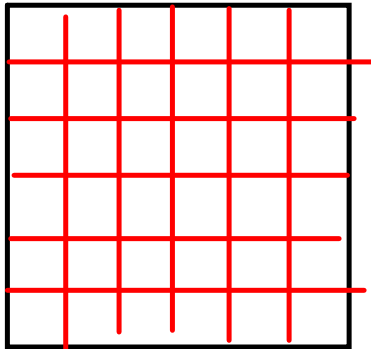
8a) $1^2 =$
 $10^2 =$
 $100^2 =$
 $100^2 =$

$$\sqrt{7^2} = 7$$

$$\downarrow$$

$$\sqrt{49}$$

11a) 225 → there are 9 factors (odd # of factors)
So perfect square number.



pg 19 Square each number

$$5a) 4^2 = 4 \times 4 = 16$$

$$6a) 8^2 = 8 \times 8 = 64$$

7. Find square root

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

8 Square

$$a) 12^2$$

$$b) 10^2$$

$$c) 100^2$$

$$d) 1000^2$$

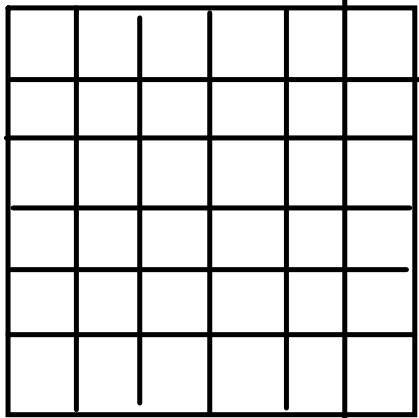
9 a)

$$\frac{50}{1 \times 50}$$

$$2 \times 25$$

$$5 \times 10$$

$$1, 2, 5, 10, 25, 50$$



400

1 x 400

2 x 200

4 x 100

5 x 80

8 x 50

10 x 40

20 x 20

$$\begin{array}{r} \underline{256} \\ 1 \times 256 \\ 2 \times 128 \\ 4 \times 64 \\ 8 \times 32 \\ 16 \times 16 \end{array}$$

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