



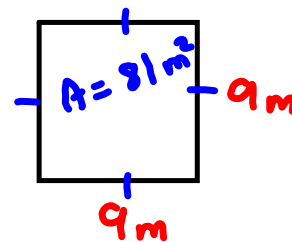
Warm Up
Feb. 7, 2023

Grade 8

A square room has area of 81 m^2

a) Find the length of a side of the room

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



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

$$\begin{aligned} 36 \text{ m} &\div 1.5 \text{ m} \\ &24 \end{aligned}$$

You need 24 pieces of baseboard.



Solution Warm Up
Oct. 27, 2014

Grade 8

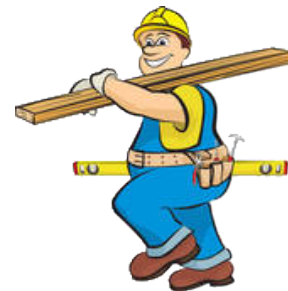
A square room has area of 81 m^2

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

$1.5 \text{ m} \times 10 = 15 \text{ m}$	$1.5\text{m} \times 24 = 36$ $1.5\text{m} \times 25 = 37.5$ $1.5\text{m} \times 26 = 39$
$1.5 \text{ m} \times 20 = 30 \text{ m}$	
$1.5 \text{ m} \times 30 = 45 \text{ m}$	

Handwritten notes: 'up by 15' in purple, 'up by 15' in green, 'up by 15' in green, 'up by 15' in green.

or

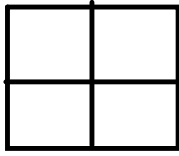
$$\begin{array}{r} 24 \\ 1.5 \overline{)36} \\ \underline{30} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

long division

Need 24 pieces

pg 8

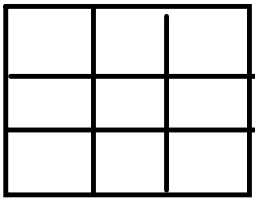
4 a)



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

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

c)



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

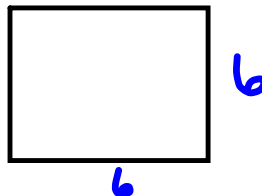
5 a) $A = l \times w$
 $= 8 \times 8$
 $= 64 \text{ units}^2$

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

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

Area	Length	Width
36	1	36
	2	18
	3	12
	4	9
	6	6

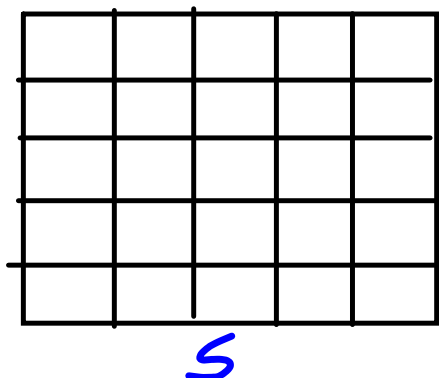
Yes, 36 is a perfect square
 $6 \times 6 = 36$



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

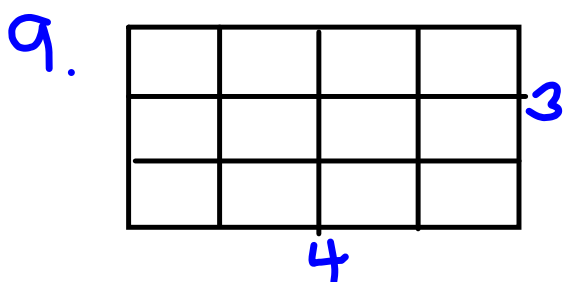
No 28 is not a perfect square, there is no number that you can multiply twice (by itself) to get 28.

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.

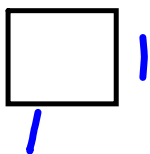
No factors the same

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

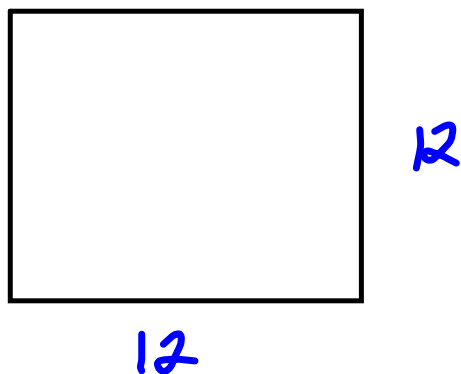
$$\begin{array}{l} 3 \times 3 = 9 \\ 4 \times 4 = 16 \end{array}$$

No whole numbers that multiply by itself will give 12.

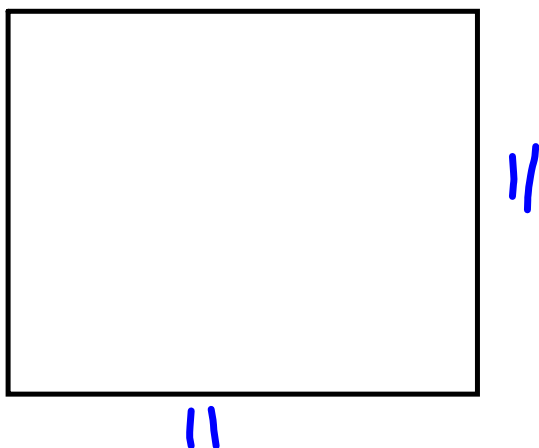
10. a) 1



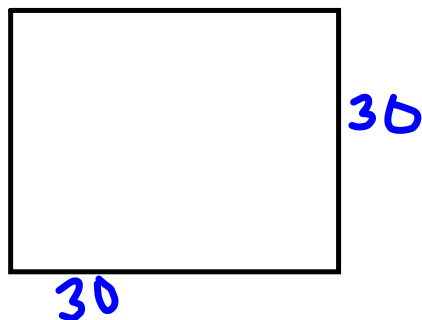
b) 144



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.

2a) 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
 $4 \times 4 = 16$ $5 \times 5 = 25$

Write out the factors for each number below

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

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

1

$$\frac{2}{1 \times 2}$$

1, 2

$$\frac{3}{1 \times 3}$$

1, 3

$$\frac{4}{1 \times 4}$$

2 x 2

1, 2, 4

$$\frac{5}{1 \times 5}$$

1, 5

$$\frac{6}{1 \times 6}$$

2 x 3

1, 2, 3, 6

$$\frac{7}{1 \times 7}$$

$$\frac{8}{1 \times 8}$$

2 x 4

1, 2, 4, 8

$$\frac{9}{1 \times 9}$$

3 x 3

1, 3, 9

$$\frac{10}{1 \times 10}$$

2 x 5

1, 2, 5, 10

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.

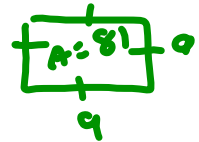
x^2 Section 1.2 $\sqrt{\quad}$ Squares and Square Roots

Discuss a number having an odd number of factors.

Study
*

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

$$\sqrt{\text{Area}} = \text{side} \quad \sqrt{81} = 9$$



Ex) The factors of 136 are listed below:

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

Is 136 a square number? How do you know?

It has 8 factors
↓
Even # of
Factors
Not perfect

136

(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



- This is the symbol for square root.

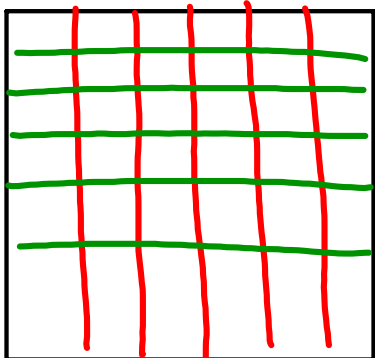
6 is the square root of 36

$$\sqrt{36} = 6$$

side length

Square Roots - $\sqrt{\quad}$
 Given $\sqrt{\text{Area}} = \text{side}$

Draw a square with the following little squares inside it:
 Area (a) 36 Side = $\sqrt{36} = 6$ (b) 9 Side = $\sqrt{9} = 3$ (c) 4 Side = $\sqrt{4} = 2$ (d) 64 Side = $\sqrt{64} = 8$



36 is _____

_____ = _____

so _____ = _____

I can also say

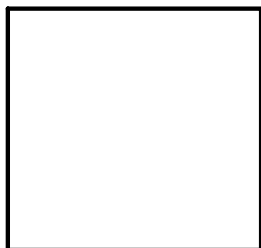


9 is a _____

_____ = _____

_____ = _____

so _____ = _____

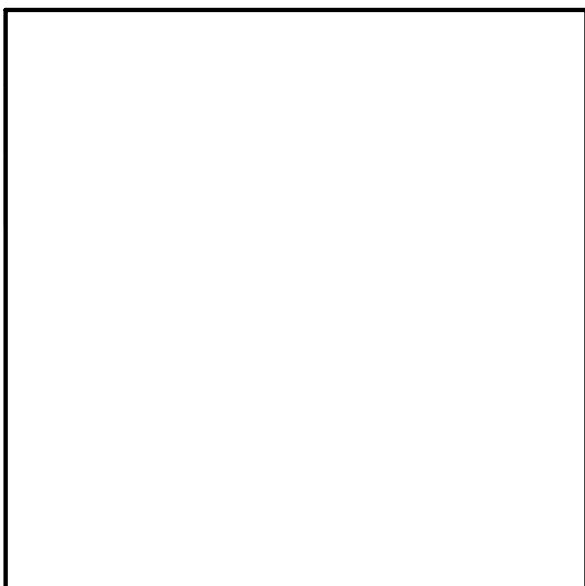


4 is a _____

_____ = _____

_____ = _____

So _____ = _____



64 is a _____

_____ = _____

so _____ = _____

Class/Homework

page. 14

Square 11
 $11^2 = 121$
 11×11



5ab

6(a,b,cd),

7(a,b,cd),

8(a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z),

10(a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z),

11(a,b),

12(a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z),

14,

15,

$\rightarrow \sqrt{3^2} = \sqrt{9} = 3$

Square \rightarrow means x^2 or times by self
Square root $\Rightarrow \sqrt{\quad}$

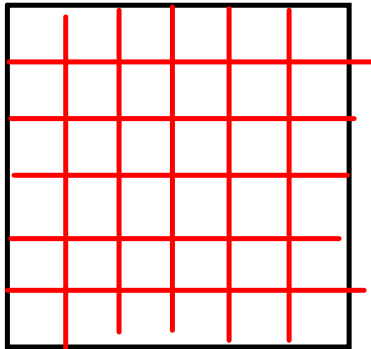
Square

5) Find the square \Rightarrow # x #

$$\text{Square } 11 \Rightarrow 11 \times 11 \text{ or } 11^2 = 121$$

6) Find
 $15^2 = 15 \times 15 = 225$

Square root
 $\sqrt{\quad}$
Find square root of
 $64 \Rightarrow \sqrt{64} = 8$



pg 15 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

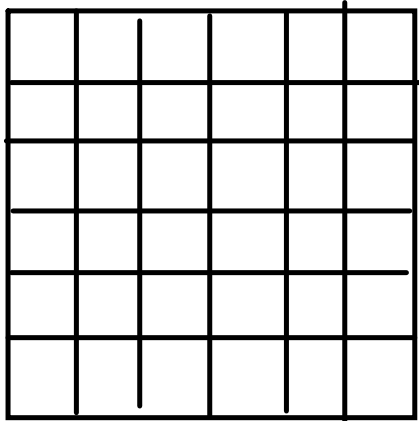
a) 1^2

b) 10^2

c) 100^2

d) 1000^2

9 a) $\frac{50}{1 \times 50}$
 2×25
 5×10
 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